IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

Case No. 05-CV-329-GKF(SAJ)

STATE OF OKLAHOMA
Plaintiff

v.

TYSON FOODS, INC., et al.,
Defendants

Affidavit of Herman J. Gibb, Ph.D., M.P.H.

Introduction

1. I am retained by the defendants to provide my expert opinion as to whether the application of poultry litter in the Illinois River Watershed (IRW) presents an imminent and substantial endangerment to public health. The following report describes my qualifications, my evaluation of the epidemiologic data on salmonellosis and campylobacteriosis available for the counties in Oklahoma and Arkansas that are in the IRW, an evaluation of the data on the waters in the IRW of Oklahoma considered impaired for Primary Body Contact Recreation, and a conclusion with respect to health risk of the poultry litter application in the IRW.
2. I conclude, based on my expert evaluation of the information contained in the record of this case and in relevant scientific literature, that there is no evidence of a health risk from the application of poultry litter in the Illinois River Watershed, much less an "imminent and substantial endangerment to public health".

Qualifications

3. I am President of Sciences International, Inc., a health risk assessment consulting company in Alexandria, Virginia, and an Adjunct Professor in Environmental and Occupational Health at the George Washington University School of Public Health and Health Services in Washington, D.C.
4. I currently am a member of the World Health Organization's Foodborne Epidemiology Reference Group. The purpose of the Group is to develop an estimate of the global burden of disease from foodborne illness.
5. Prior to joining Sciences International in January 2004, I had a 29-year career at the United States Environmental Protection Agency (EPA). Most of my career was spent at EPA's National Center for Environmental Assessment where I served as Associate Director for Health, Assistant Center Director, and staff epidemiologist.
6. I received EPA's Gold Medal for Exceptional Service for my risk assessment analysis of the epidemiologic studies on arsenic in drinking water, EPA's Scientific and Technological Award as the senior author of an epidemiologic study on chromate production workers, and EPA's Award for September 11 Activities, World Trade Center Particulate Matter Toxicological Assessment Team. I directed EPA's health and

exposure assessment of the ambient pollution which resulted from the collapse of the World Trade Center. I served on two White House Interagency Committees on health risk assessment and a White House Interagency Committee on mercury in the Gulf of Mexico.

7. I am a co-author of the World Health Organization's Environmental Health Criteria Document on the *Principles for the Assessment of Risks to Human Health from Exposure to Chemicals*. I am the author or co-author of numerous publications on epidemiology and health risk assessment.

Background

8. On November 14, 2007, a motion was filed by the State of Oklahoma, alleging that poultry litter generated by Tyson Foods et al. may present an imminent and substantial endangerment to health or the environment in the IRW. To support this contention plaintiff states that 1) eight water bodies within the Oklahoma portion of the IRW have been listed as impaired for primary body contact recreation (PBCR) by the State because of bacteria associated with poultry litter, and 2) increased incidences of disease associated with fecal bacteria have been documented in two Oklahoma counties, including Adair County which constitutes the largest portion of land within the Oklahoma land area within the IRW.

Epidemiologic data cited by Dr. Christopher Teaf

9. Dr. Teaf's affidavit states that Oklahoma State Department of Health records show that Adair County reported rates of campylobacteriosis considerably in excess of the state average for the period 1997 to 2005 and rates of salmonellosis that periodically exceeded the average statewide average rate for the years 1990-2005 (para 19, Teaf 2007). He also states that the rate of salmonellosis in Sequoyah County was reported to exceed the State rate for all but three years during the period 1990 to 2001.

10. The rates of salmonellosis and campylobacteriosis for Adair and Sequoyah Counties are not specific for waterborne transmission. Although salmonella and campylobacter can be

transmitted by water, most cases are believed to be transmitted by food (American Public Health Association 2004; World Health Organization 2005a; World Health Organization 2000). Even the Oklahoma Department of Health (OSDH) states that most cases of salmonellosis and campylobacteriosis are caused by eating contaminated food (OSDH 2007; OSDH 2005). The CDC states that most cases of campylobacteriosis are associated with handling raw poultry or eating raw or undercooked poultry meat (CDC 2005) and that salmonella are usually transmitted to humans by eating foods contaminated with animal feces (CDC 2006a).

11. Not only are most cases of salmonellosis and campylobacteriosis transmitted by food, there are other reservoirs for these organisms besides poultry. The American Public Health Association (2004) states that reservoirs of campylobacter include poultry, cattle, puppies, kittens, other pets, swine, sheep, rodents and birds. Reservoirs of salmonella include domestic and wild animals including poultry, swine, cattle, rodents, and pets such as iguanas, tortoises, turtles, terrapins, chicks, dogs and cats, and humans.

12. OSDH reports investigations of salmonellosis and campylobacteriosis outbreaks on its web site for the years 2002-2006. In that period of time, there were seven outbreaks of salmonellosis and four outbreaks of campylobacteriosis investigated. None were found to be associated with contaminated water.

13. Dr. Teaf (para 19, Teaf 2007) focused on a comparison of Adair and Sequoyah Counties with the State of Oklahoma and concludes that Adair and Sequoyah Counties had elevated rates of campylobacteriosis and salmonellosis. In Appendices 1-10, the rates of campylobacteriosis and salmonellosis are graphed for all the counties in the state for the years 2002-2006. The counties in the IRW are color-coded to distinguish them from the rest of the counties. These charts illustrate that there are many counties with higher rates of campylobacteriosis and salmonellosis than either Adair or Sequoyah County for each of the years, and there is no temporal trend with regard to the rates across the years for either Adair or Sequoyah County or for any county in the IRW. Furthermore, there are counties in the IRW that have lower rates than the State of Oklahoma average for the years 2002-2006.

14. The United States Department of Agriculture provides information on the number of broilers and other meat-type chicken farms and the number of broilers and other meat-

type chickens sold by county for all counties in the United States. The most current report is that for 2002. USDA (2002a, 2002b) reports the number of broilers and other meat-type chickens and the number of broiler and other meat-type chicken farms for the counties in Oklahoma and Arkansas. Appendices 11 and 12 are graphs of the number of broilers and other meat-type chickens sold per county with the campylobacteriosis rates for the counties in Oklahoma and Arkansas. Appendices 13 and 14 do the same for the salmonellosis rates. Appendices 15-18 are graphs of the number of broiler and other meat-type chicken farms and the number of broilers and other meat-type chickens per county with the campylobacteriosis and salmonellosis rates. The R^2 value on each of the graphs indicates the amount of correlation between the measure of poultry production (number of broiler and other meat-type chickens sold or number of broiler and other meat-type chicken farms) with the disease rates. If the R^2 was "1", it would indicate a perfect correlation; a "0" would indicate no correlation. The p value indicates the probability that the measure of poultry production and the disease rate is correlated. A probability which is less than 0.05 suggests that a correlation is statistically significant. As can be seen in all of the graphs with the exception of the graph in Appendix 18, there is no correlation between the poultry production in the counties of Arkansas and Oklahoma with the disease rates for campylobacteriosis and salmonellosis. The graph in Appendix 18 demonstrates a statistically significant negative correlation between broiler and other meat-type chicken farms with the salmonellosis rates for the counties in Arkansas (i.e., the more farms the lower the salmonellosis rate).

Risk of Disease Caused By Impairment of Water Bodies in the IRW cited by Drs. Teaf and Lawrence

15. Dr. Teaf states that there are 8 water bodies within the Oklahoma portion of the IRW categorized as impaired for Primary Body Contact Recreation (PBCR) as a result of pathogens and indicator bacteria including E coli, enterococci, and/or fecal coliforms (para 11, Teaf 2007) and that a major recreational use affected by the impaired waters is "floating". Dr. Teaf (para 12, Teaf 2007) states that exceedances have been documented in 18 different locations throughout the IRW.

16. Dr. Lowell Caneday, in his affidavit for Oklahoma, described "floating" as the use of canoes, kayaks, rafts, or other inflatable floats (para 12, Caneday 2007). Dr. Caneday described the non-floater recreational experience as a visit to one of the public access locations where the visitor then swims, picnics, sunbathes, and occasionally camps (para 15, Caneday 2007).

17. Dr. Lawrence stated that, on a regular basis, bacterial contamination of the Illinois River and its watershed exceeds levels considered a threat to public health and recreational use of the Illinois River by tens of thousands of people each year places them at an unacceptable risk for exposure to pathogens from poultry litter (para 9, Lawrence 2007).

18. The Clean Water Act as amended requires states to develop lists of water bodies that do not meet water quality standards and to submit lists of these water bodies to the U.S. EPA every two years. The most recent report by the Oklahoma Department of Environmental Quality was prepared in 2006 (ODEQ 2006a). In Appendix C of the Report (ODEQ 2006b) are listed the Category 5 water bodies. Category 5 water bodies are those considered impaired for one or more uses.

19. ODEQ (2006b) lists nine water bodies in the IRW that are impaired because of enterococci, E coli, and/or total coliform and states the sources of the impairments for the nine water bodies are as follows:

    a. Unknown (5 water bodies)
    b. Not applicable (1 water body)
    c. Unknown and municipal discharges (1 water body)
    d. Grazing in riparian or shoreline zones, on-site treatment systems (septic systems and similarly decentralized systems), rangeland grazing, wildlife other than waterfowl, and unknown (1 water body)
    e. Grazing in riparian or shoreline zones, on-site treatment systems (septic systems and similarly decentralized systems), permitted runoff from confined animal feeding operations, rangeland grazing, total retention domestic sewage lagoons, wildlife other than waterfowl, and unknown (1 water body)

20. The ODEQ does not state that the source of bacterial impairment for any of the water bodies in the IRW for 2006 is a result of poultry litter. For one water body, ODEQ states that a cause is confined animal feeding operations but does not specify poultry.

21. EPA (2008) reported on the 2004 impairment of water bodies for all states in the U.S. In Oklahoma, there were 532 bacterial impairments. Only 14 of those occurred in the IRW, and their source was unknown or not applicable (ODEQ 2004). It would be highly improbable that all the impairments due to bacteria in the State of Oklahoma could be the result of poultry litter.

22. The ODEQ Primary Body Contact Recreation standard is based on the EPA (1986) Ambient Water Quality Criteria for Bacteria. EPA (1986) developed an "acceptable swimming associated gastroenteritis rate per 1,000 swimmers" for freshwater based on enterococci and E coli density per 100 ml. These standards were based on the results of epidemiologic studies conducted at beaches at Erie, Pennsylvania and Keystone Lake, Oklahoma between 1979 and 1982. Two beaches were studied at each location. At both locations, the source of the bacteria was treated sewage.

23. The determination of illness was based on telephone interviews. A statistically significant increase in "highly credible gastrointestinal symptoms (HCGI)[1]" was found only at the beach with poorer water quality at the Erie location and was not found at either of the two beaches studied at Keystone Lake (EPA 1984).

24. Regression equations of the enterococci and E coli densities per 100 ml data with the HCGI were developed. These regression equations were then used to estimate the E coli and enterococci densities that would be associated with an "acceptable risk[2]" of 8 illnesses per 1,000 swimmers.

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[1] This symptom category was defined as including any one of the following symptoms: (1) vomiting, (2) diarrhea with fever or a disabling condition (remained home, remained in bed or sought medical advice because of the symptoms) and (3) stomachache or nausea accompanied by a fever. EPA used this category to define gastrointestinal illness rather than total GI symptoms because, as they acknowledged, all of the symptoms were self-diagnosed and therefore subject to variable interpretation.

[2] The determination of what is considered acceptable derives from a recommendation made by the National Technical Advisory Committee (NTAC 1968). NTAC cited studies done in the late 1940s and early 1950s at Lake Michigan and on the Ohio River in which an "epidemiologically detectable health effect" was found to occur between 2300 and 2400 total coliforms per 100 ml. Subsequent studies determined that 18 percent of the total coliforms were fecal coliforms (i.e. about 400 fecal coliforms per 100 ml) and that fecal coliforms were a better indicator of disease than total coliforms. NTAC (1968) recommended that a safety factor of two be employed and therefore that the water quality criteria for fecal coliform content of primary recreational waters be 200 fecal coliforms/100 ml. EPA (1986) estimated a risk of disease of 8 per 1,000 for 200 fecal coliforms/100 ml using the studies conducted at Lake Eric and Keystone Lake. Using the ratios of enterococci and E coli to fecal coliform, EPA estimated the densities of these bacteria that would be associated with a risk of disease of 8 per 1,000. Although EPA (1986) used the fecal coliform data for Lake Erie and and Keystone Lake to estimate a risk of 8 per 1,000, they did not recommend the use of fecal coliform as an ambient water criterion because it was noted that in some cases, fecal coliforms are routinely detected where fecal contamination is absent.

25. EPA (1986) stated that the estimated risk of 8 per 1,000 associated with a geometric mean of 33 enterococci and 126 E coli is "only approximate." A panel of experts convened by EPA (2007) to evaluate research needs for the development of new or revised recreational water quality criteria stated that "It is not certain how accurate the current levels of protection are. 'Magic' numbers like 8 or 19 cases of gastroenteritis in 1,000 swimmers can 'take on a life of their own,' increasing the risk of distraction from the basic objective—providing best effort to protect swimmers. This provides a compelling reason for not deriving and using a single numeric value for the targeted risk for new or revised AWQC."

26. The fecal contamination at Keystone Lake and Erie was of human origin. While EPA (2002) stated that, as a precaution, the Water Quality Criteria should apply to non-human fecal contamination; it also stated that there was little information to evaluate this issue. They described a study by Calderon (1991) which found no evidence of risk to swimmers in a water body heavily contaminated by unidentified sources of animal feces. A more recent study by Colford et al. (2007) found no evidence between levels of traditional fecal indicator bacteria and illness in Mission Bay, California where the predominant source of fecal contamination was avian. The authors believed their results to be due to a lack of human sources of traditional fecal indicator bacteria. The World Health Organization stated that greater human health risks are likely to be associated with human fecal material and that the use of fecal bacteria alone as an index of risk to human health may significantly overestimate risks where the index organisms derive from sources other than human excreta (WHO 2003). EPA (2007) stated that it is widely believed that human feces pose a larger health risk than animal feces to swimmers and other primary contact recreational water users. This belief derives from the basic concept that virtually all enteric pathogens of humans are infectious to other humans, while relatively few of the enteric pathogens of animals are infectious to humans.

27. The water quality criteria are based on epidemiologic studies of swimmers in which the swimming activity in the studies was "rigidly defined" as having all upper body orifices exposed to the water. The recreational activities described by Dr. Caneday suggest that the majority of recreational activity in the IRW does not involve having all upper body orifices exposed to water.

28. The Centers for Disease Control periodically report on waterborne-disease outbreaks associated with recreational water (CDC 2006b, 2004, 2002, 2000, 1998, 1996). No reports of bacterial waterborne disease outbreaks associated with untreated recreational waters occurred in Oklahoma during those years.

Summary

29. Comparison of the salmonellosis and campylobacteriosis rates of the counties in the IRW with the state rates for these diseases ignores the fact that these diseases are primarily believed to be acquired through foodborne transmission.

30. None of the investigations of disease outbreaks of salmonellosis and campylobacteriosis by the OSDH found an outbreak to be waterborne.

31. The county rates of campylobacteriosis and salmonellosis for the years 2002 through 2006 do not demonstrate evidence of a problem in the IRW.

32. There is no evidence that the number of poultry farms or the number of poultry in a county is associated with increased rates of salmonellosis or campylobacteriosis.

33. ODEQ does not report that the impairment of any water body in the IRW is caused by poultry litter.

34. Exceedance of the EPA water quality criteria for enterococci or E coli is not prima facie evidence that disease is occurring or will occur as a result of fecal contamination in the IRW:

    a. The water quality criteria are two-fold lower than a concentration at which effects are believed to have occurred.
    b. There is considerable uncertainty in the methodology used to develop the criteria.
    c. The epidemiologic studies on which the EPA water quality criteria are based evaluated exposure to human fecal matter. Two studies which evaluated risks to swimmers from non-human waste found little if any evidence of disease risk. Authorities such as WHO have concluded that human feces pose a larger health risk than animal feces to swimmers and other primary contact recreational water users.

d. Most of the recreational activity in the IRW is "floating"; the EPA water quality criteria are based on studies of swimmers in which the swimming activity was defined as having all upper body orifices exposed to water.

35. There is no evidence of bacterial waterborne disease outbreaks in Oklahoma associated with untreated recreational water for the period 1993-2004.

Conclusions

36. There is no evidence of campylobacteriosis or salmonellosis associated with waterborne transmission of the bacteria in the IRW and no evidence that these diseases are associated with poultry litter.

37. There is no evidence that poultry litter is causing bacterial "impairments" of water bodies in the IRW and no evidence of bacterial waterborne disease outbreaks in Oklahoma associated with untreated recreational water.

38. Exceeding the EPA water quality criteria for bacteria in the IRW is not prima facie evidence that disease is occurring. The Water Quality Standard has a margin of safety which does not equate to an imminent and substantial endangerment to health.

39. In summary, there is no evidence of a health risk from the application of poultry litter in the Illinois River Watershed.

Herman J Gibb, PhD, MPH

Sworn to and subscribed before me, in my presence this 7 day of February, 2008. A Virginia Notary Public, in and for the State at Large

Carlton West Notary Public

My commission expires August 31, 2010

CARLTON WEST NOTARY PUBLIC COMMONWEALTH OF VIRGINIA Expires 08-31-10 ID# 7062124

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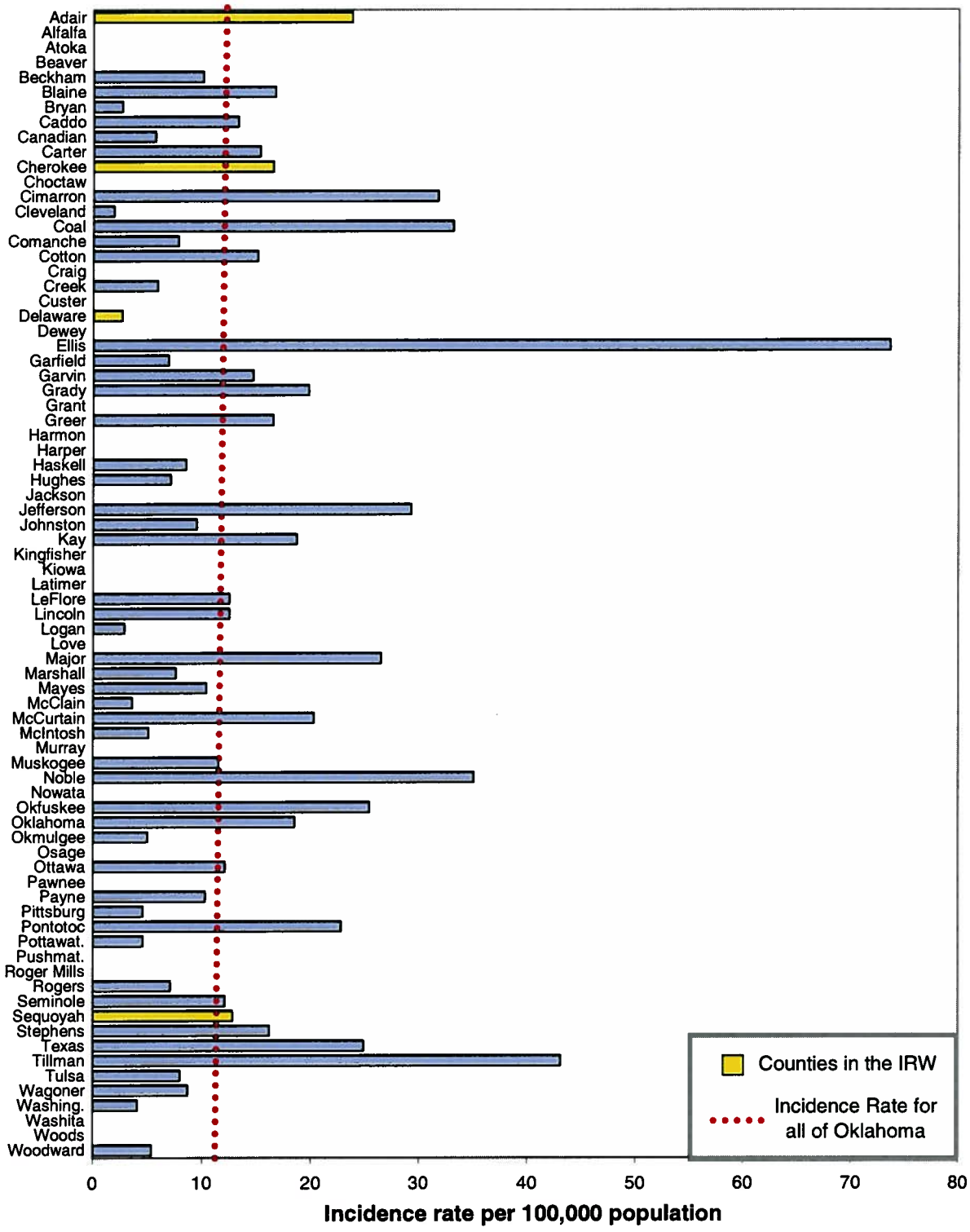
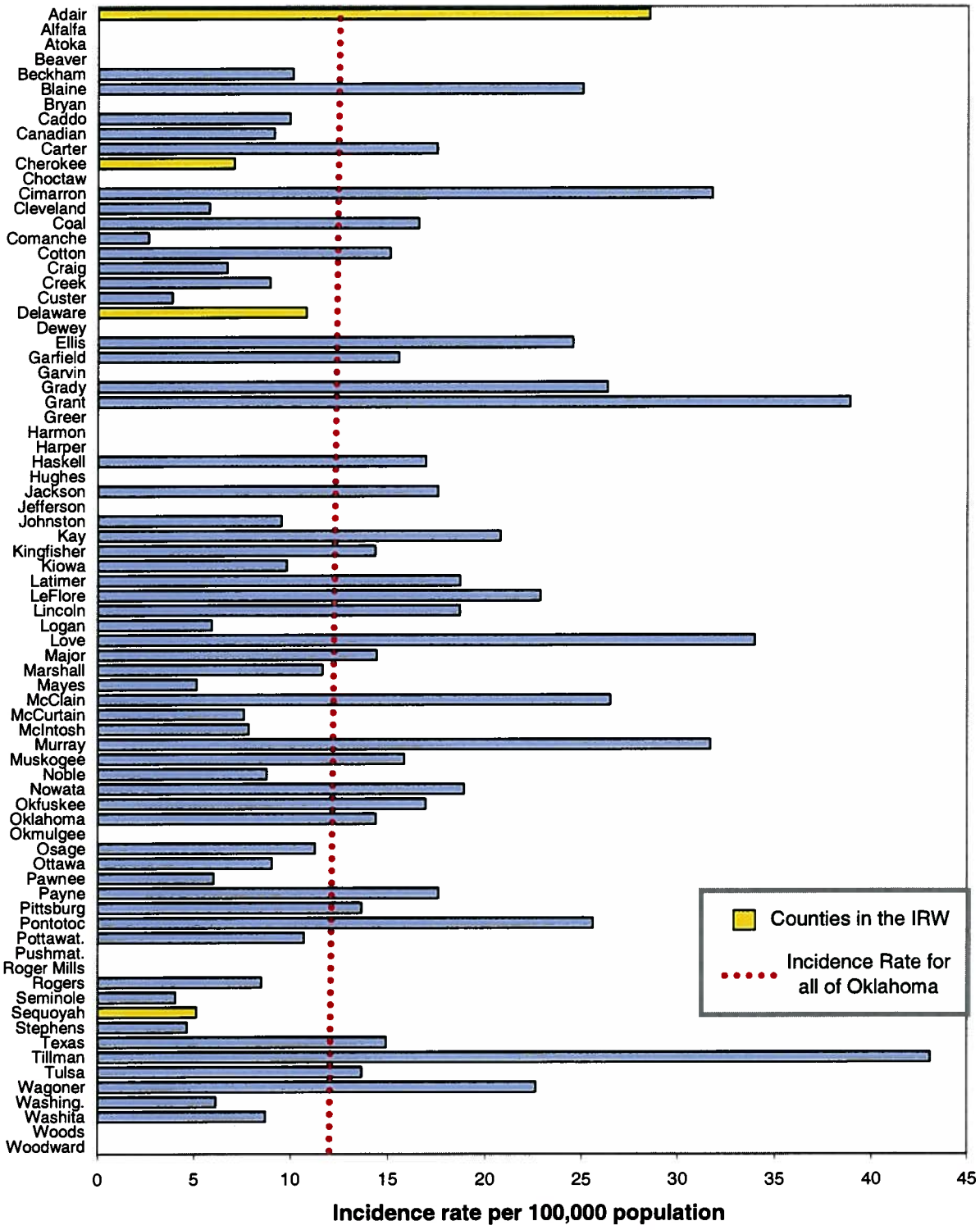
APPENDICES

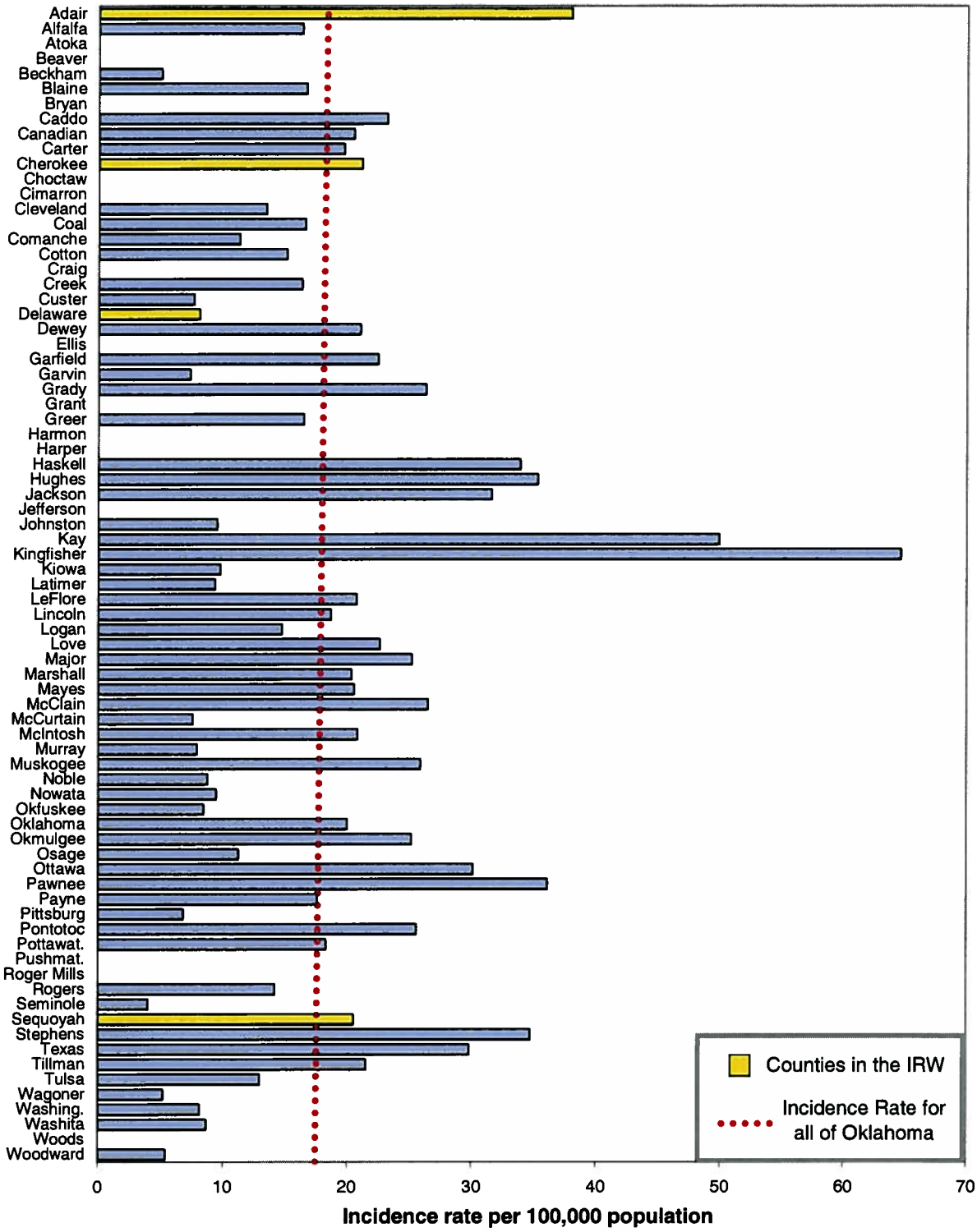
Appendix 1. Campylobacteriosis Rate by County in Oklahoma, 2002



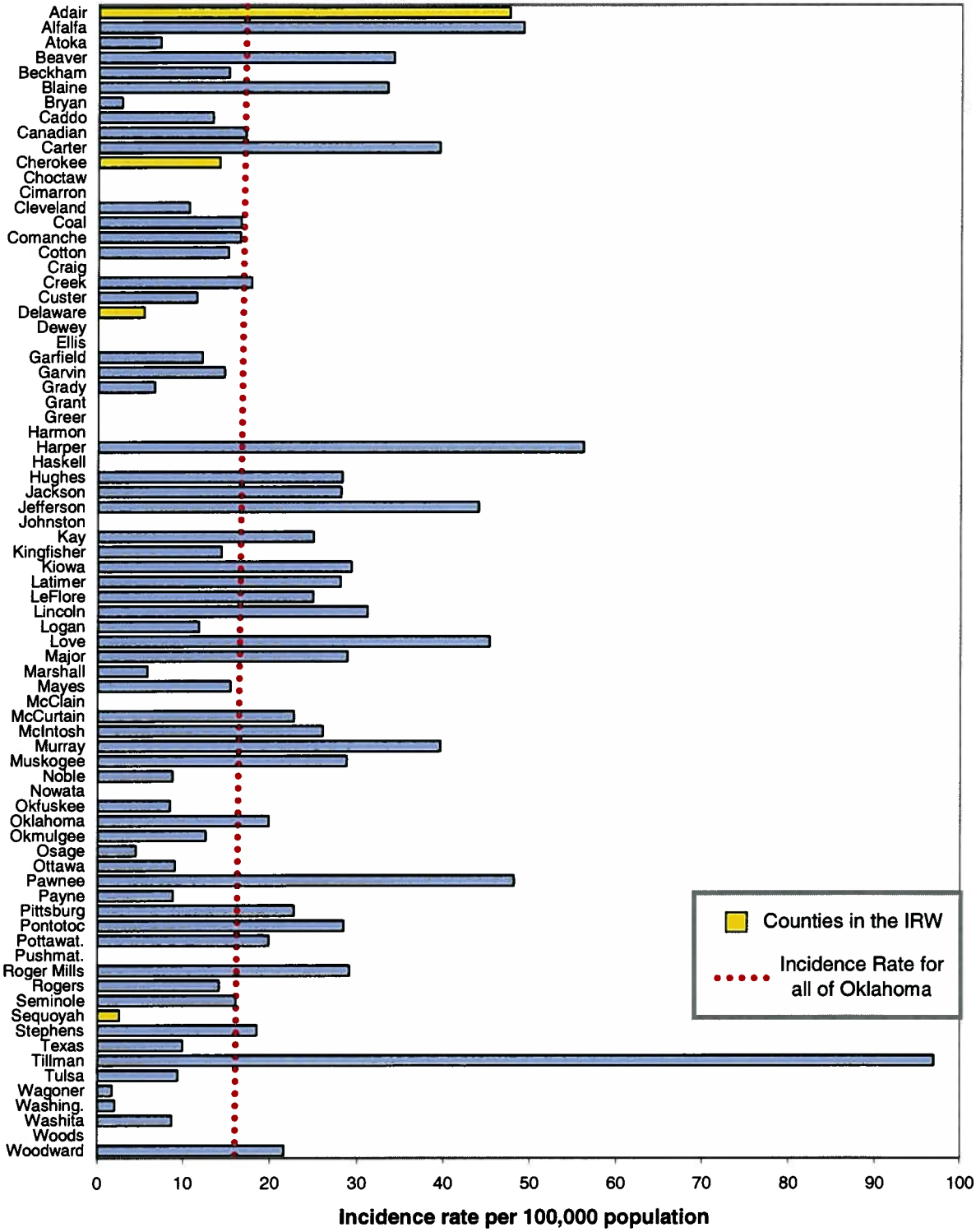
Appendix 2. Campylobacteriosis Rate by County in Oklahoma, 2003



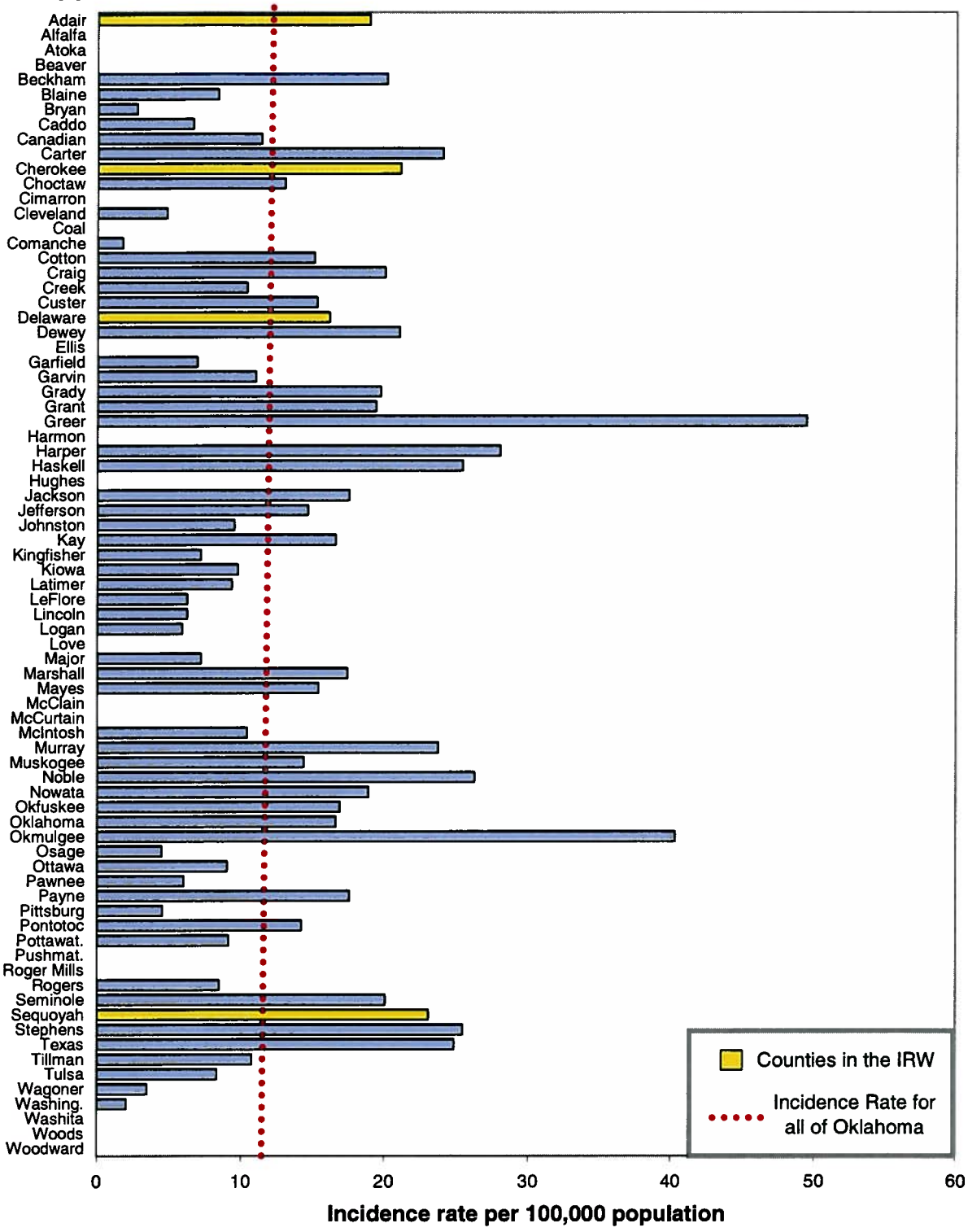
Appendix 3. Campylobacteriosis Rate by County in Oklahoma, 2004



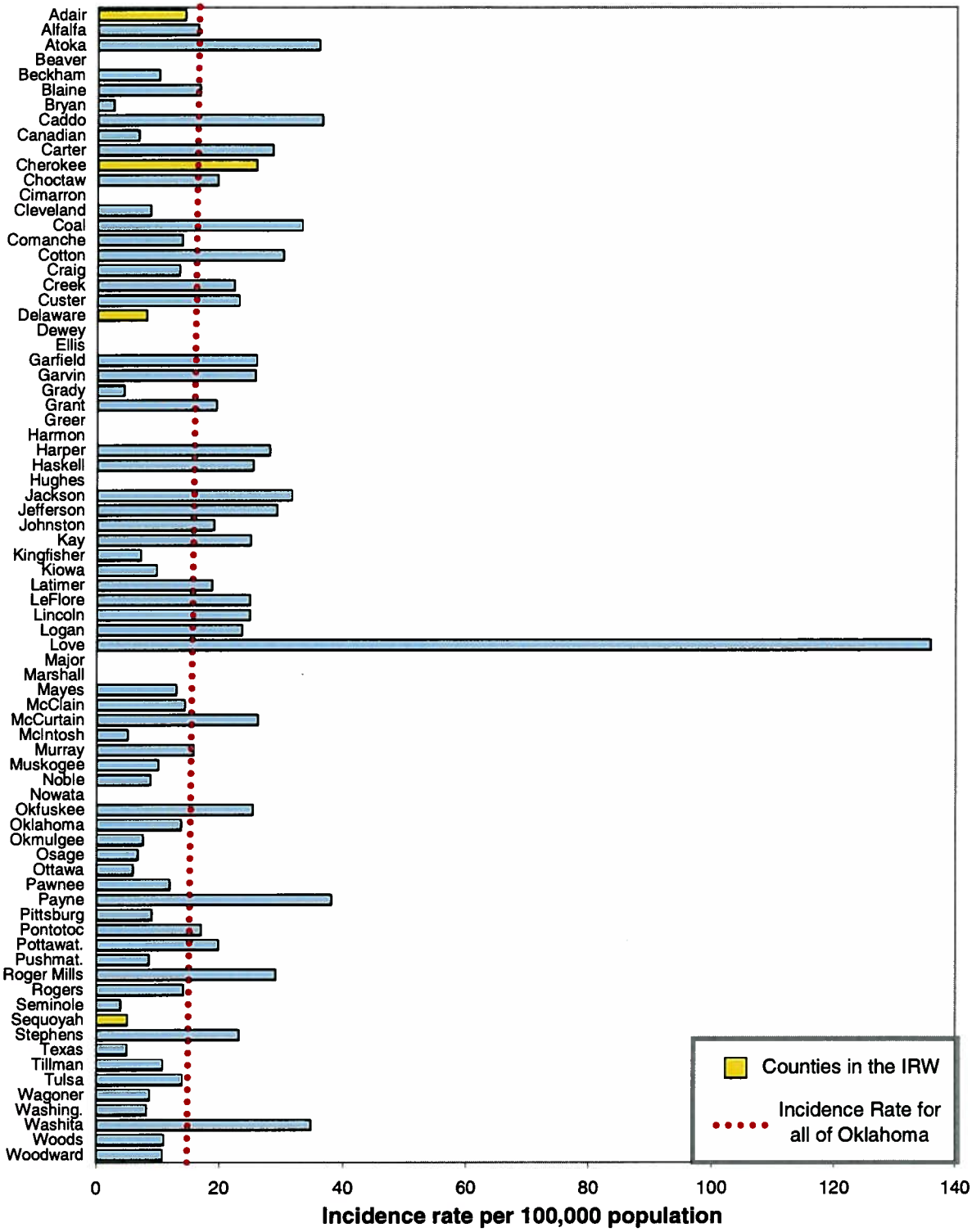
Appendix 4. Campylobacteriosis Rate by County in Oklahoma, 2005



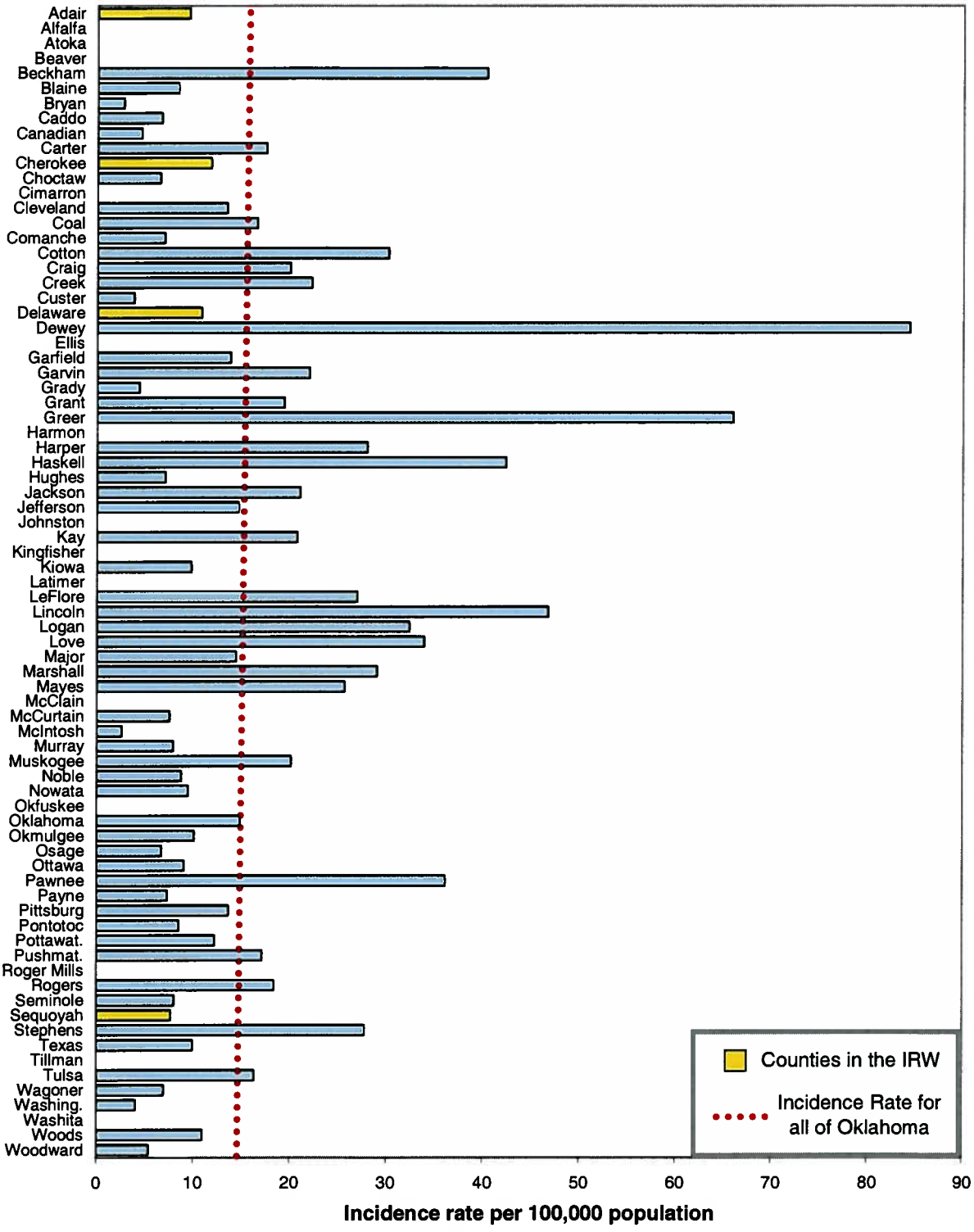
Appendix 5. Campylobacteriosis Rate by County in Oklahoma, 2006



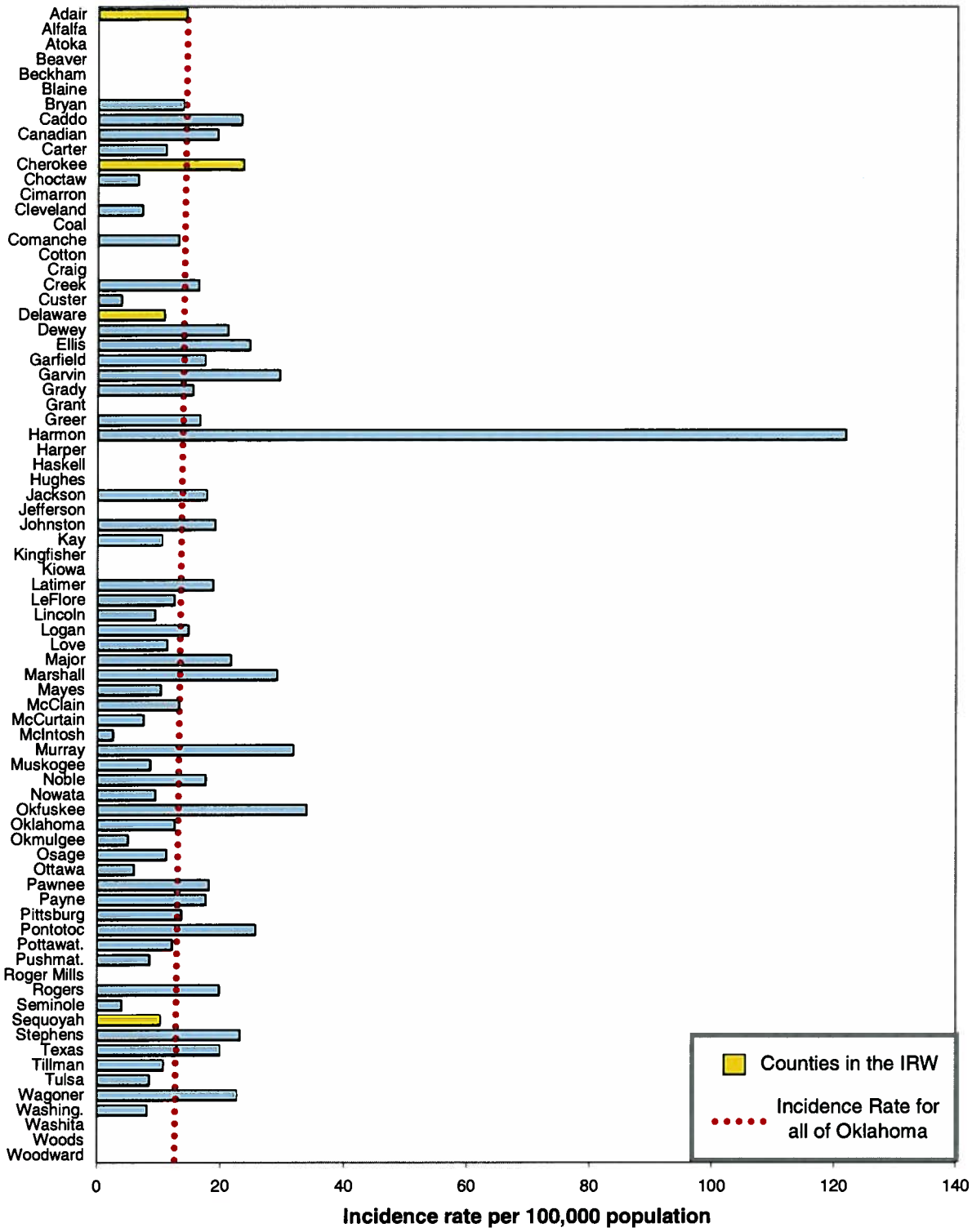
Appendix 6. Salmonellosis Rate by County in Oklahoma, 2002



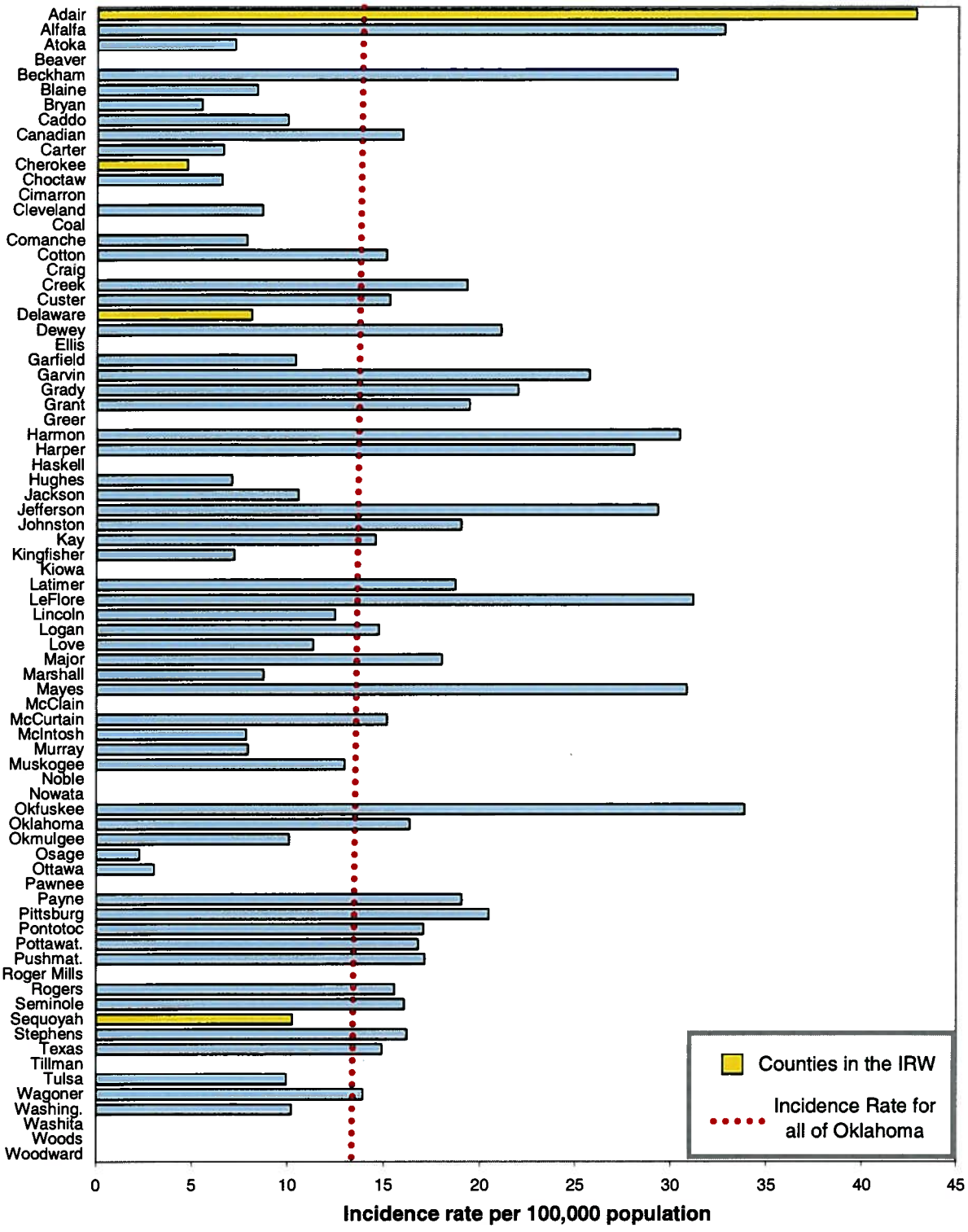
Appendix 7. Salmonellosis Rate by County in Oklahoma, 2003



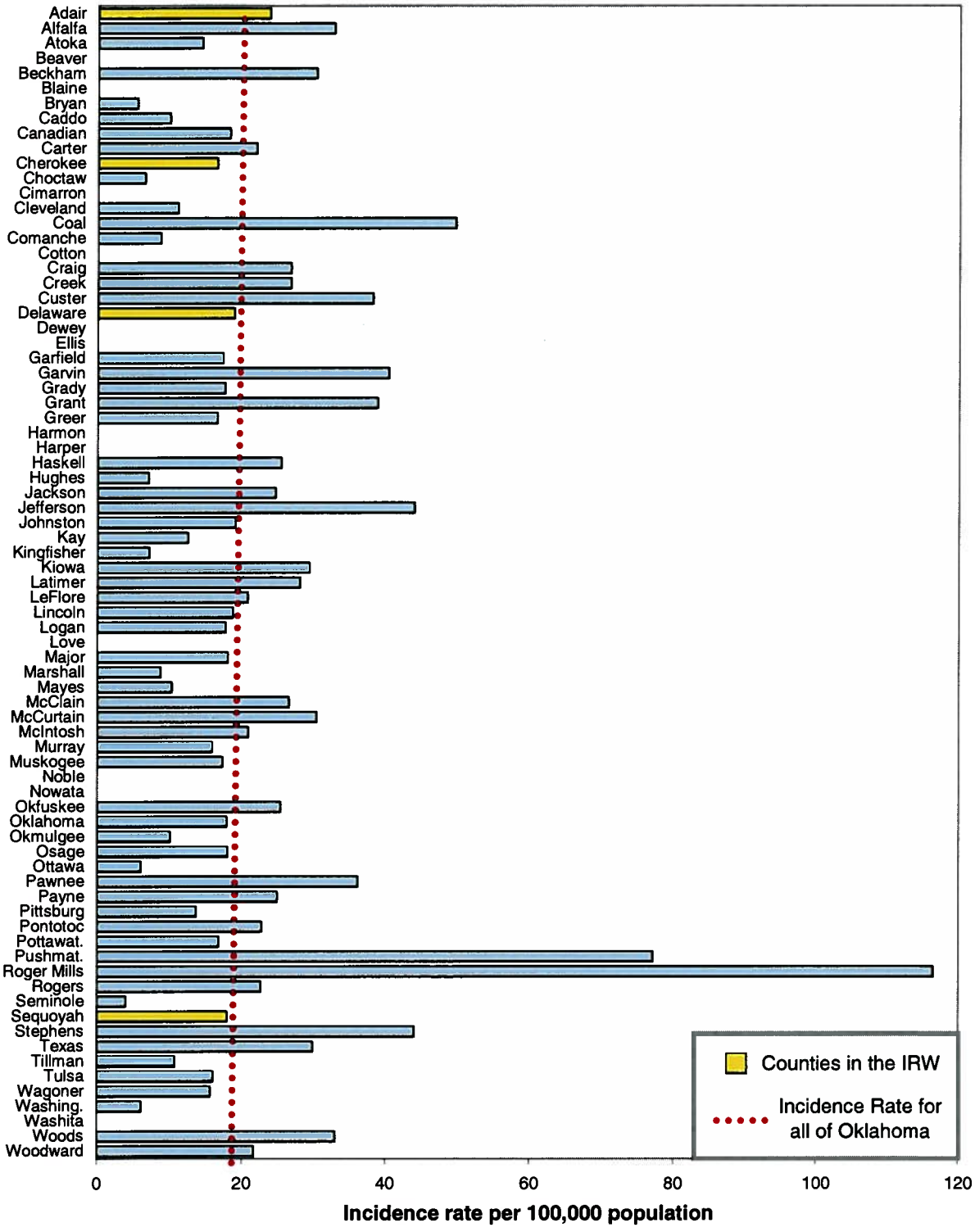
Appendix 8. Salmonellosis Rate by County in Oklahoma, 2004



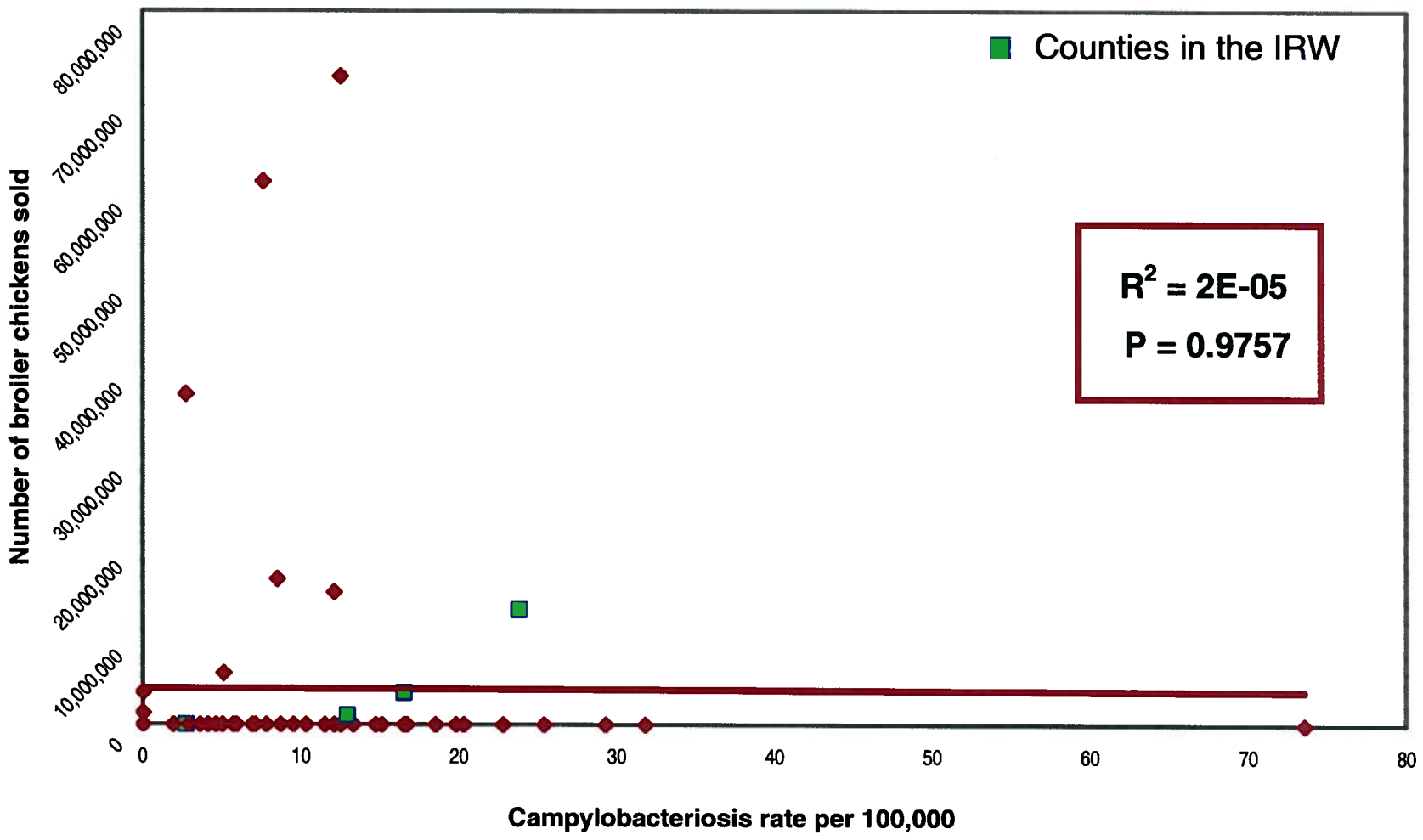
Appendix 9. Salmonellosis Rate by County in Oklahoma, 2005



Appendix 10. Salmonellosis Rate by County in Oklahoma, 2006

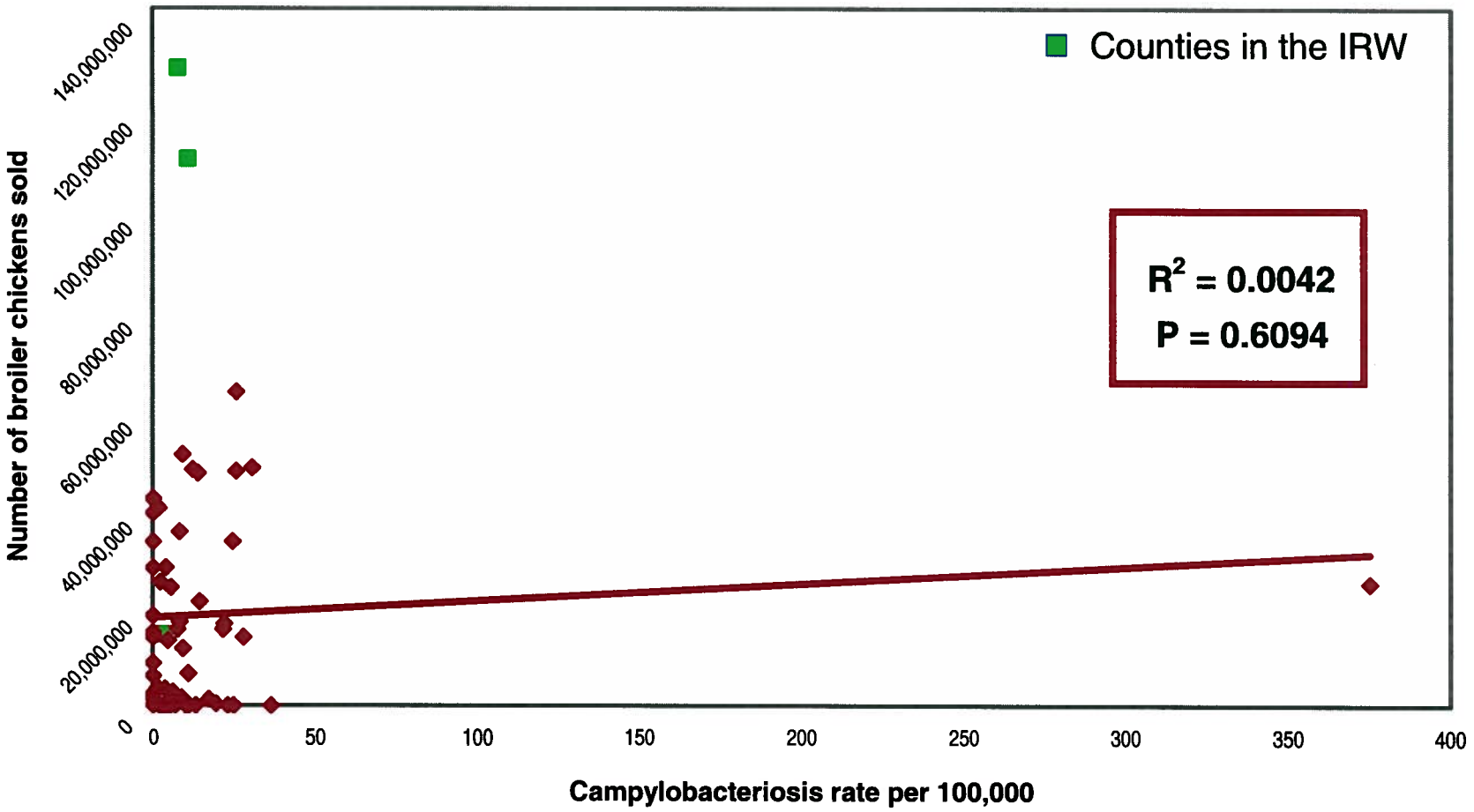


Appendix 11. Campylobacteriosis Rate and Number of Broiler and Other Meat-Type Chickens Sold* in Oklahoma Counties, 2002



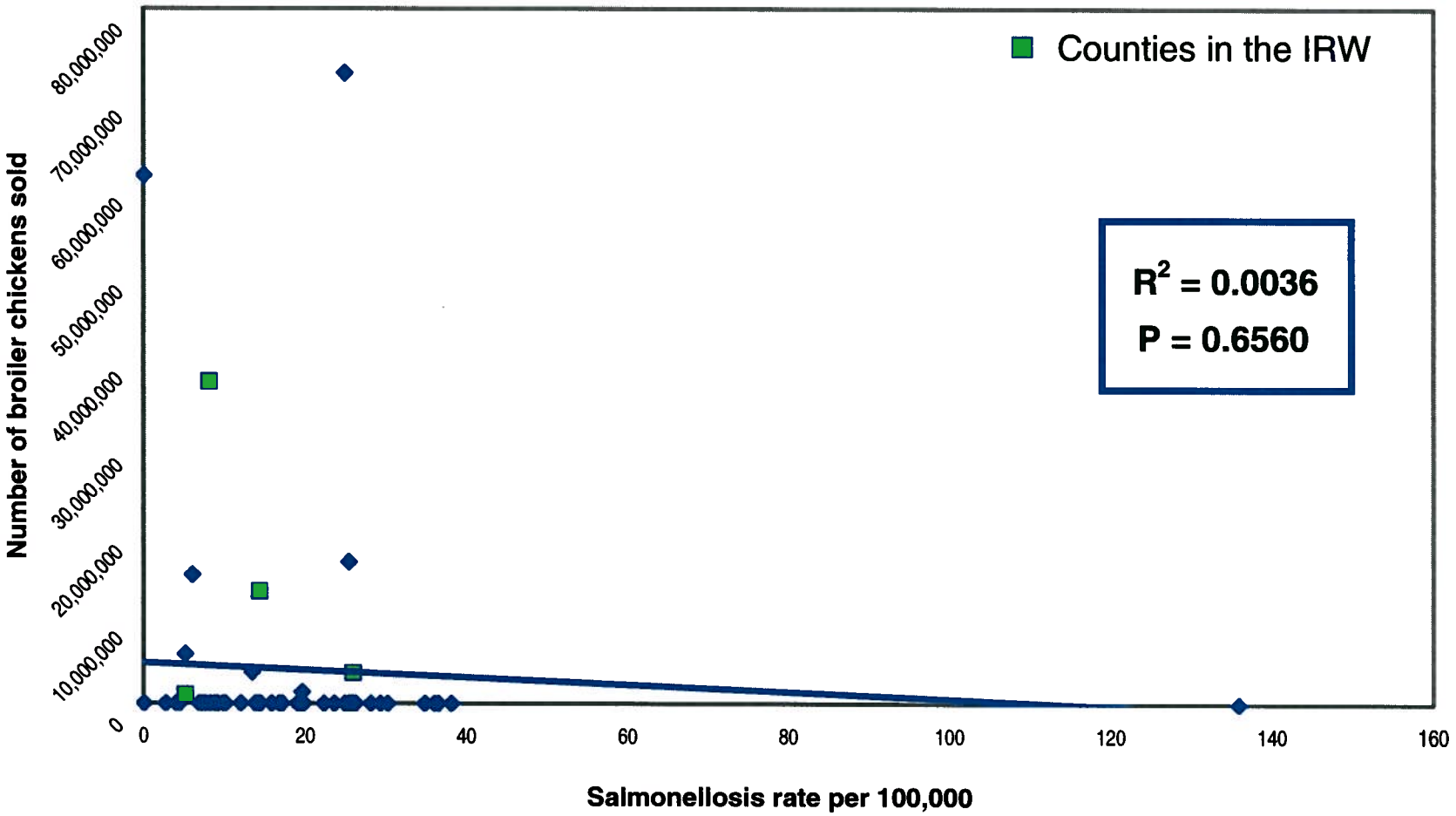
*Twenty counties with <3 farms are excluded due to lack of data on number of broiler and meat-type chickens sold
Sources: USDA 2002 Census of Agriculture; Oklahoma State Department of Health 2002 Annual Summary of Infectious Diseases

Appendix 12. Campylobacteriosis Rate and Number of Broiler and Other Meat-Type Chickens Sold* in Arkansas Counties, 2002



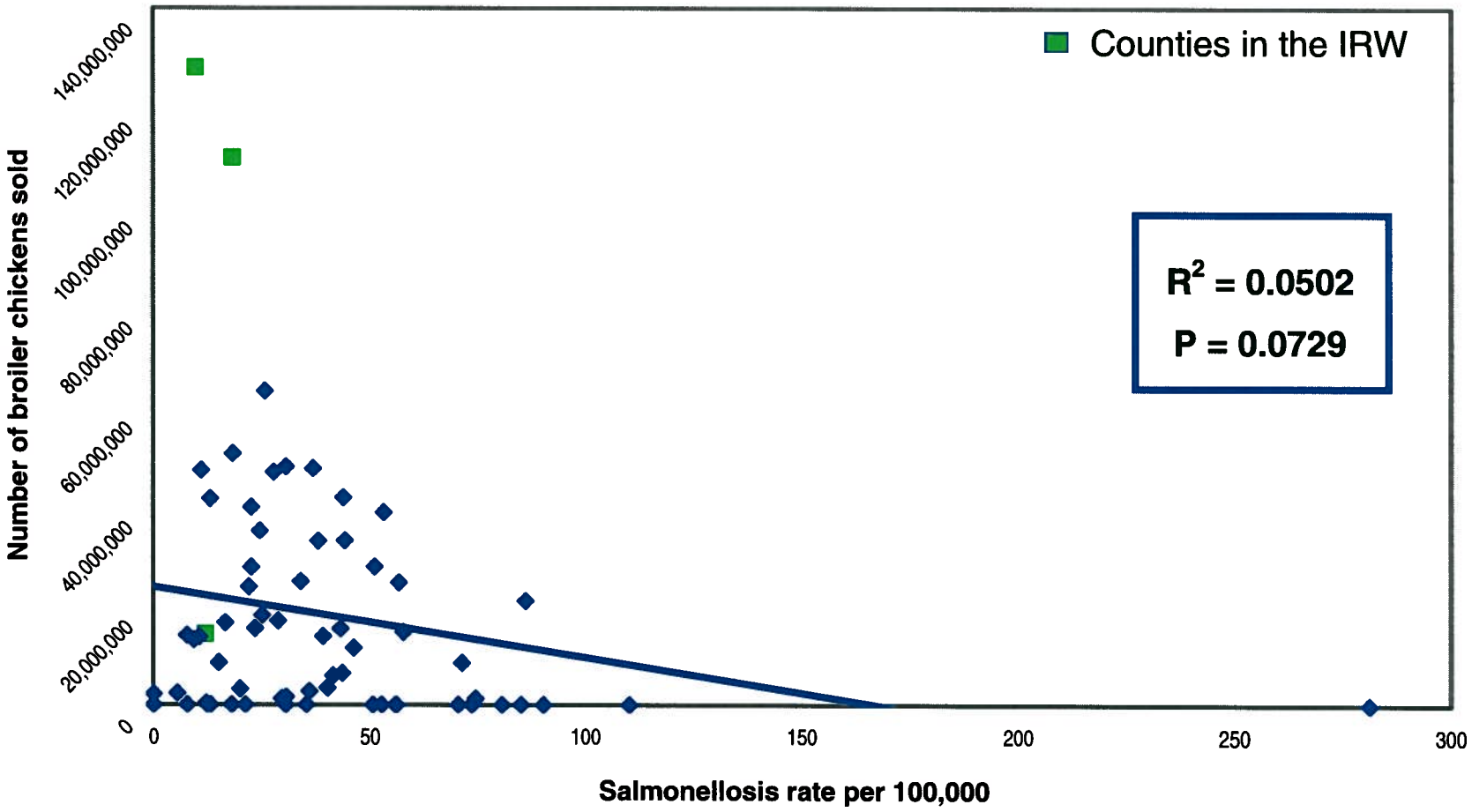
*Ten counties with <3 farms are excluded due to lack of data on number of broiler and meat-type chickens sold
Sources: USDA 2002 Census of Agriculture; Arkansas Department of Health 2008 Foodborne Disease Rates - 10 Year Summary

Appendix 13. Salmonellosis Rate and Number of Broiler and Other Meat-Type Chickens Sold* in Oklahoma Counties, 2002



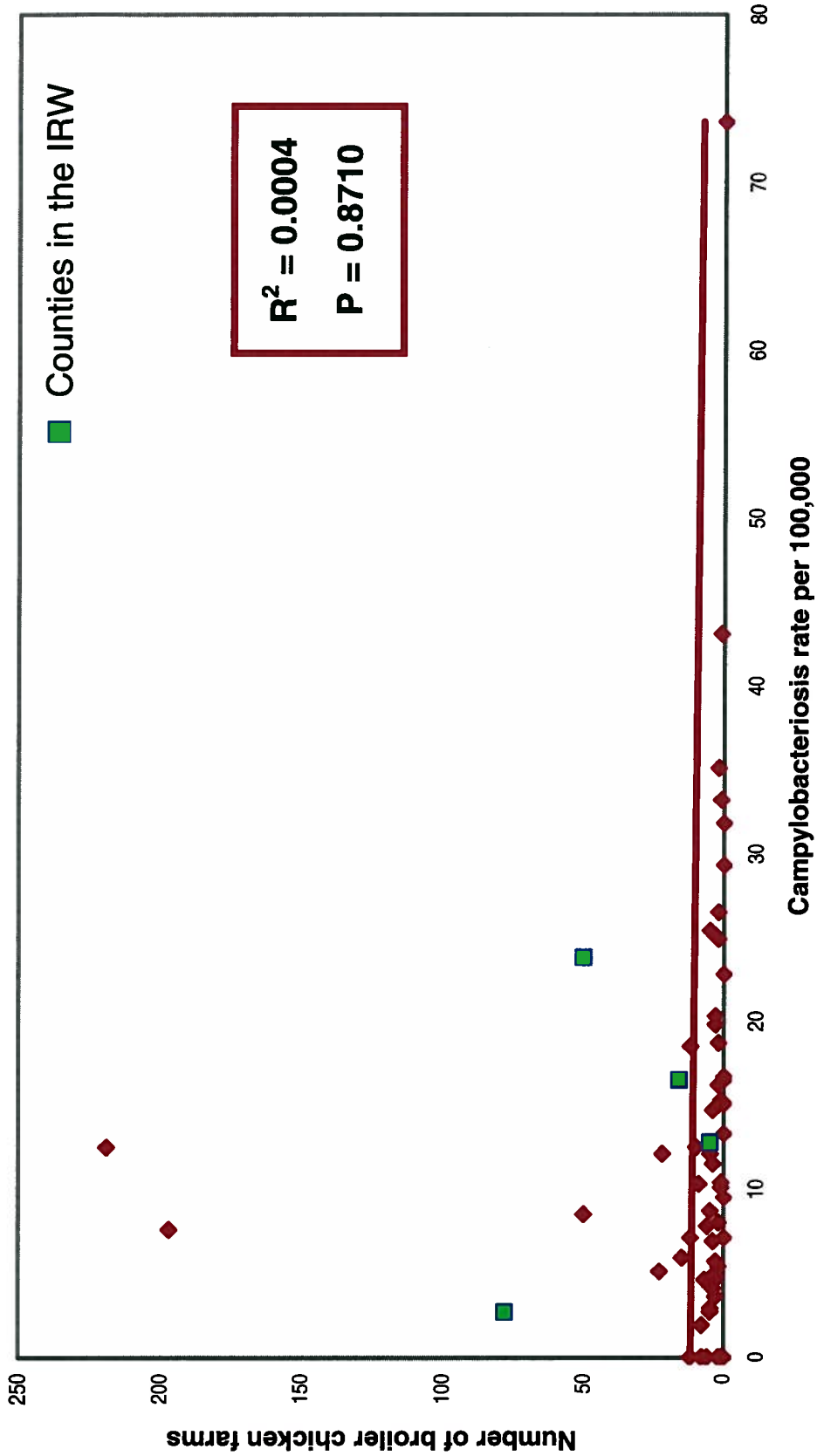
*Twenty counties with <3 farms are excluded due to lack of data on number of broiler and meat-type chickens sold
Sources: USDA 2002 Census of Agriculture; Oklahoma State Department of Health 2002 Annual Summary of Infectious Diseases

Appendix 14. Salmonellosis Rate and Number of Broiler and Other Meat-Type Chickens Sold* in Arkansas Counties, 2002



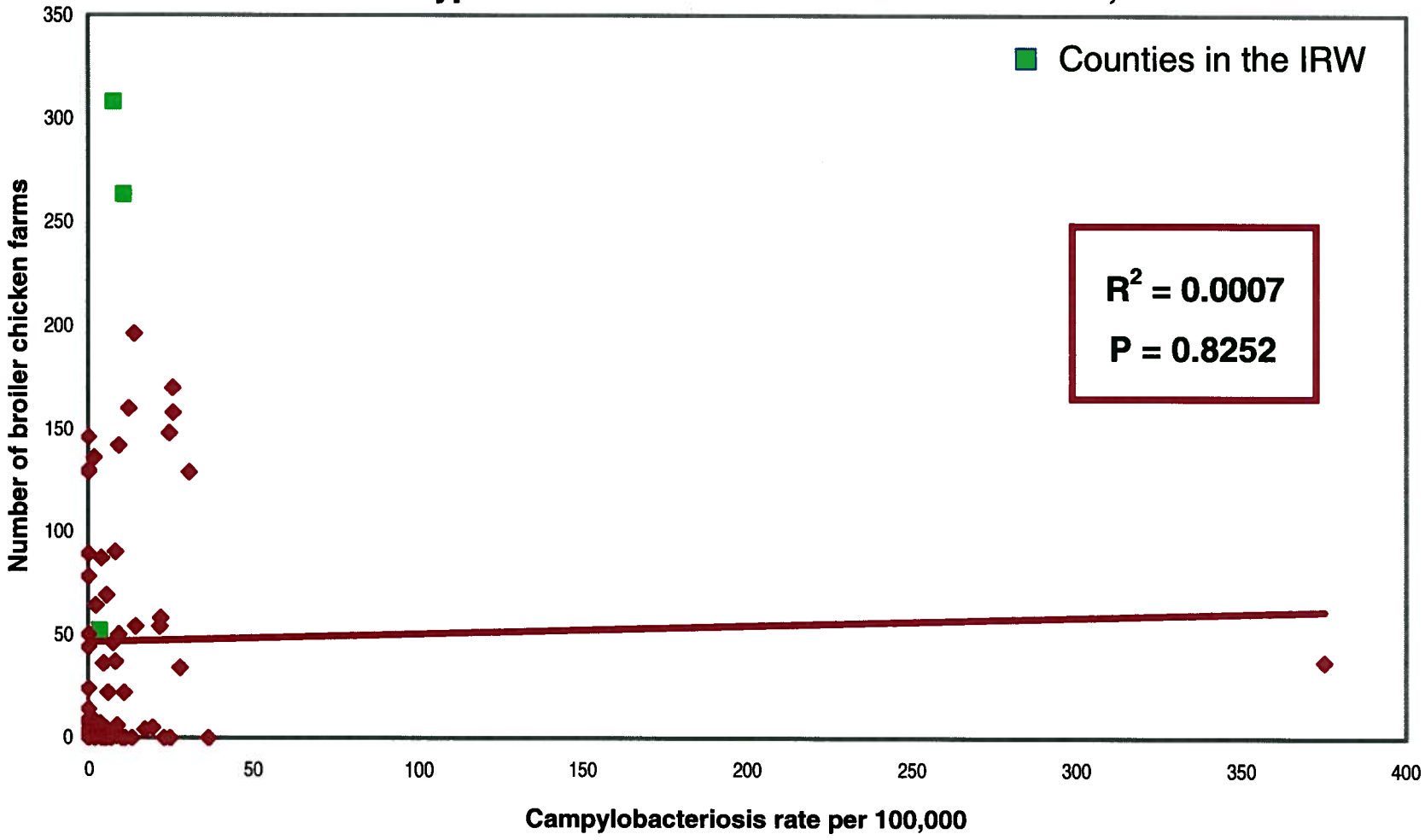
*Ten counties with <3 farms are excluded due to lack of data on number of broiler and meat-type chickens sold
Sources: USDA 2002 Census of Agriculture; Arkansas Department of Health 2008 Foodborne Disease Rates - 10 Year Summary

Appendix 15. Campylobacteriosis Rate and Number of Broiler and Other Meat-Type Chicken Farms in Oklahoma Counties, 2002



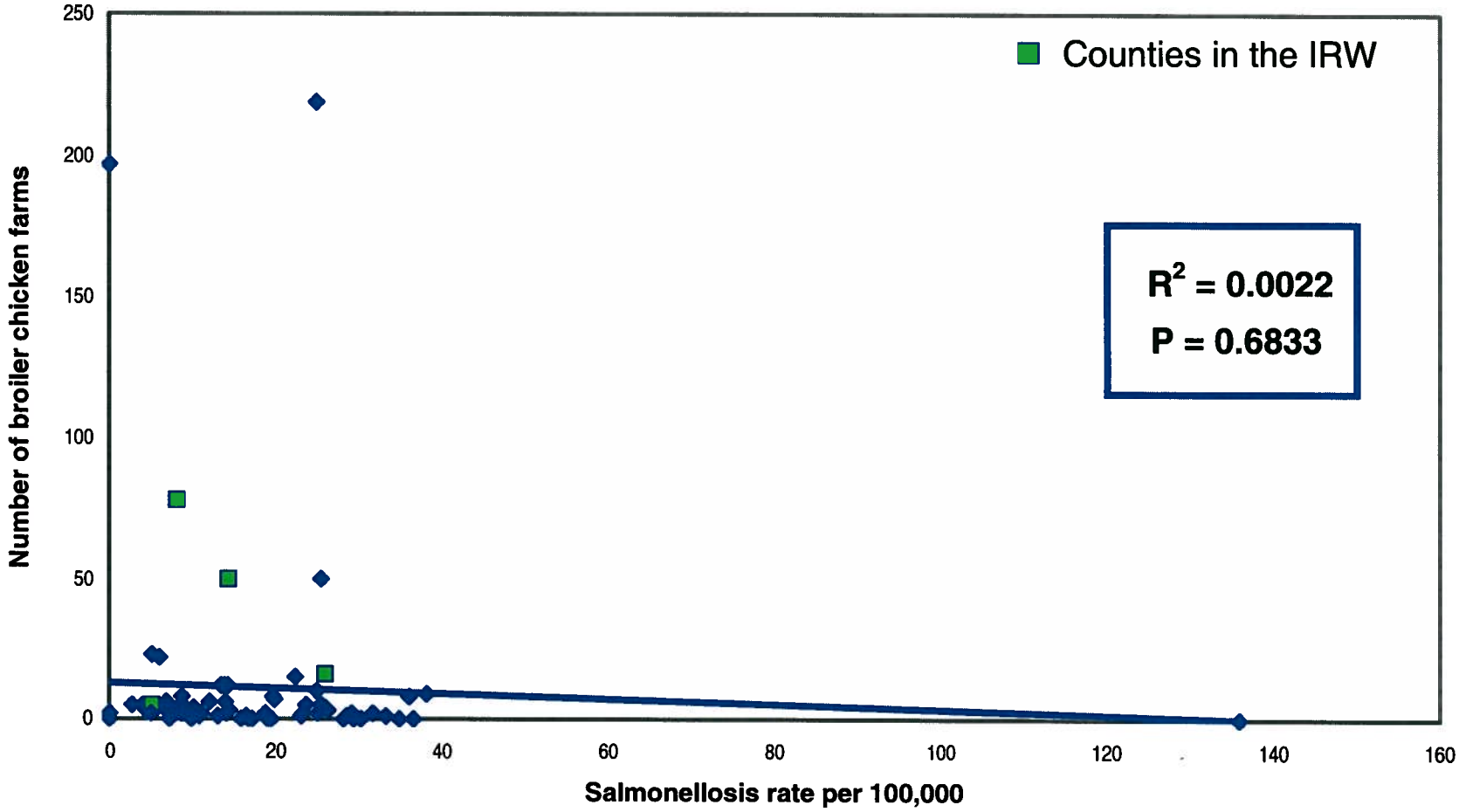
Sources: USDA 2002 Census of Agriculture; Oklahoma State Department of Health 2002 Annual Summary of Infectious Diseases

Appendix 16. Campylobacteriosis Rate and Number of Broiler and Other Meat-Type Chicken Farms in Arkansas Counties, 2002



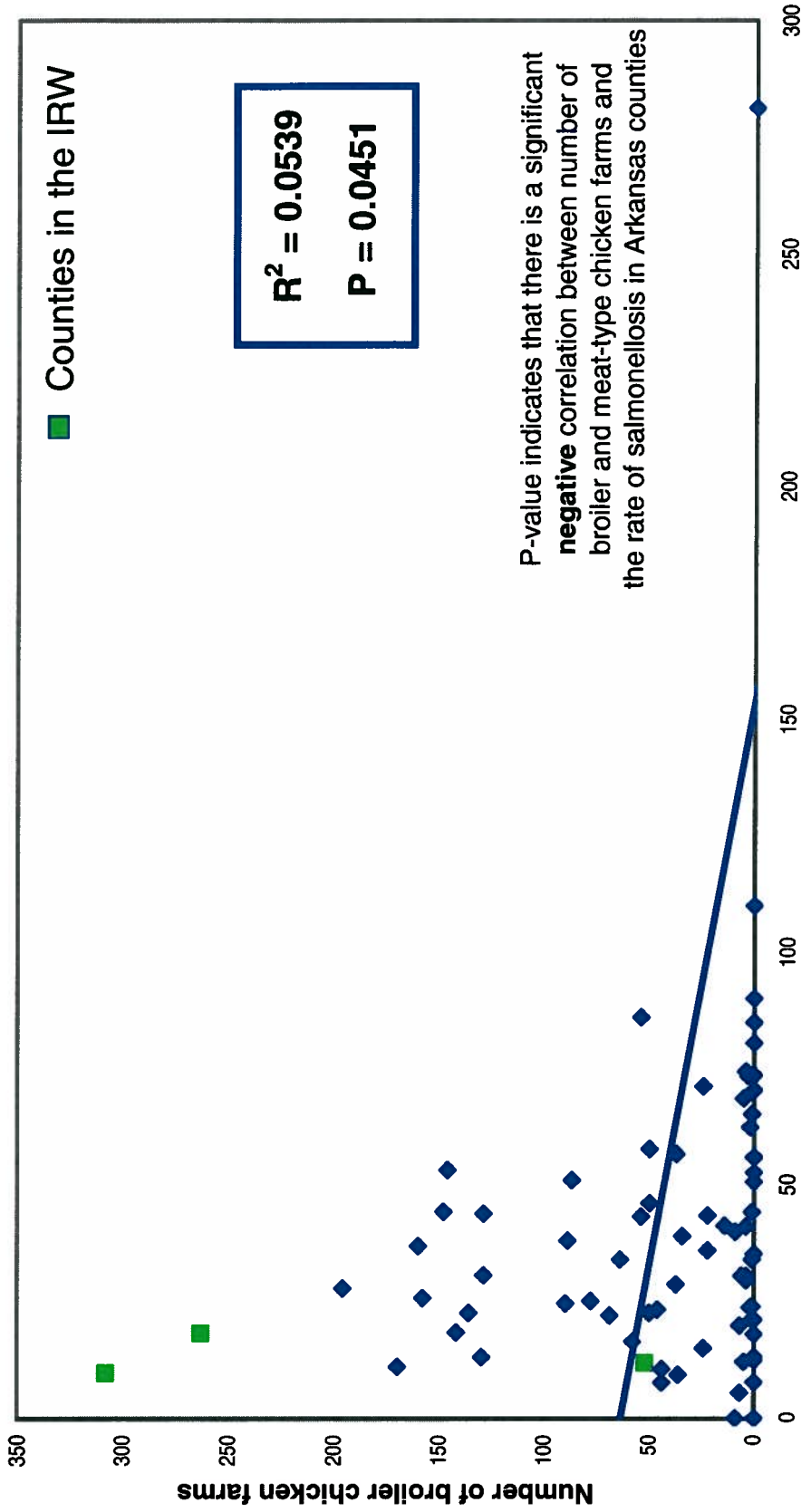
Sources: USDA 2002 Census of Agriculture; Arkansas Department of Health 2008 Foodborne Disease Rates - 10 Year Summary

Appendix 17. Salmonellosis Rate and Number of Broiler and Other Meat-Type Chicken Farms in Oklahoma Counties, 2002



Sources: USDA 2002 Census of Agriculture; Oklahoma State Department of Health 2002 Annual Summary of Infectious Diseases

Appendix 18. Salmonellosis Rate and Number of Broiler and Meat-Type Chicken Farms in Arkansas Counties, 2002



Sources: USDA 2002 Census of Agriculture; Arkansas Department of Health 2008 Foodborne Disease Rates - 10 Year Summary

HERMAN J. GIBB

EDUCATION

1989 Ph.D., Epidemiology, The Johns Hopkins University
1974 M.P.H., Environmental Health, University of Pittsburgh
1970 B.S., Chemistry and Biology, Pennsylvania State University

EXPERIENCE

Dr. Gibb is a Senior Epidemiologist with Sciences International, Inc. Since joining Sciences in January 2004, Dr. Gibb has conducted an assessment of the health effects of metals on Marinduque Island in the Philippines, provided key expert testimony on his epidemiologic study of chromate production workers at OSHA hearings in February 2005, and provided expert assistance to the U.S. Environmental Protection Agency in the creation of a Framework for the Health Assessment of Metals. Prior to joining Sciences, Dr. Gibb served as the Senior Science Advisor at the National Center for Environmental Assessment of the U.S. Environmental Protection Agency. Dr. Gibb has over 25 years of experience in health and environmental sciences and also held positions as the Associate Director for Health and Assistant Center Director at the National Center for Environmental Assessment. As the Associate Director for Health, Dr. Gibb was responsible for EPA's Integrated Risk Information System (IRIS), an on-line system of EPA's risk assessments. Dr. Gibb was the Project Officer for EPA's cooperative agreements with the World Health Organization. He was the lead author for the Office of Research and Development's multiyear research plan for mercury. Dr. Gibb is a recognized international expert on the health effects of metals and in particular arsenic, chromium, nickel, and copper. Dr. Gibb was the recipient of the EPA's Scientific and Technological Achievement Award for his study of lung cancer mortality and clinical irritation among chromate production workers. He was also the recipient of the EPA's Gold Medal for Exceptional Service for his work on the drinking water standard for arsenic.

- **Acting Senior Science Advisor**

  - Recommended revisions to the Agency's Integrated Risk Information System (IRIS) procedures to insure greater accountability, peer review involvement, public transparency, and speed of the program. IRIS is EPA's on-line data base of risk assessments. These assessments form the basis for all risk-based decisions made by the Agency.
  -Revised the peer review process for peer-review products produced by the National Center for Environmental Assessment. These revisions included issues such as public involvement in the selection of peer reviewers, public meetings for peer review as opposed to letter reviews, and whether the peer reviewers consider public comments.
  -Reviewed the use of uncertainty factors in risk assessments by EPA, identified those that are issues and proposed an approach for the National Center for Environmental Assessment to follow as regards those issues.

- **Acting Associate Director for Health**

  -Directed health risk assessment for EPA's National Center for Environmental Assessment

HERMAN J. GIBB (CONT.)

-Represented EPA on matters of health risk assessment with the Congress, other Federal agencies, industry, and internationally.

-Interacted with Associate Directors of EPA/ORD Laboratories and Centers for developing a coherent and scientifically defensible program that was responsive to the Agency's research needs.
-Served as lead author of the Office of Research and Development's Multi-year Plan for Research on Mercury
-Served on EPA's Office of Research and Development's Science Council
-Supervised EPA's Integrated Risk Information System (IRIS), an on-line data base of risk assessments conducted by EPA (www.epa.gov/iris)
-Served on White House Interagency Working Group on Mercury
-Supervised the National Center for Environmental Assessment's Exposure and Human Health Evaluation of Airborne Pollution from the Sept 11, 2001 attacks on the World Trade Center
-Served as Project Officer for the Environmental Protection Agency's two cooperative agreements with the World Health Organization (one with PEH; the other with IPCS)
-Chaired the International Technical Advisory Group of the Pan American Health Organization to a study of acute effects of copper ingestion conducted by the University of Chile, Santiago, Chile
-Member of International Program on Chemical Safety's Risk Assessment (IPCS) Steering Group
-Participated on all ten of the IPCS Concise International Chemical Assessment Document Final Review Boards (FRB), and chaired the 4th FRB in Washington, D.C.
-Served on the International Tissue and Tumor Repository for Chronic Arsenosis Advisory Board
-Served on the Presidential Advisory Board, Ana G. Mendez University System, San Juan, Puerto Rico.

- **Assistant Center Director for Planning**

-Served as National Program manager for comprehensive interdisciplinary research efforts to conduct risk assessment and facilitate risk management where such efforts reached across several different environmental media.
-Served as primary spokesperson on multimedia risk assessment research for the Office of Research and Development with the Regional and National Program offices.
-Member of senior management team for evaluation and award of resources for research projects and cooperative agreements in support of Regional Office programs to multimedia exposures.
-Served as Agency technical expert in the area of multimedia risk assessment research.
-Served as Project Officer for the Agency's two cooperative agreements with the World Health Organization.
-Served as Project Officer for study of ingested arsenic and reproductive effects in a human population in Chile.
-Represented the Agency on the White House Committee on Environment and Natural Resources (CENR) Subcommittees on Toxic Substances and Hazardous and Solid Wastes and on the Subcommittee for Risk Assessment.
-Served as Project Officer on cooperative agreement with the Johns Hopkins University for conduct of epidemiologic study of chromate production workers.
-Expert on the health effects of arsenic, chromium, and nickel.
-Served as Project Officer for major Interagency agreements with the National Institute of

Occupational Safety and Health and the National Institute of Environmental Health Sciences
-Member of National Center for Environmental Assessment's Human Resources Committee.
-Provided consultation to a cancer case-control study in Chile examining the association with arsenic exposure for the purpose of developing a cancer dose-response estimate

- **Special Assistant to the Director, Office of Health and Environmental Assessment, Office of Research and Development**
  -Identified and provided decision briefings to the Office Director on risk assessment issues
  -Coordinated meetings, correspondence, and products of the Ad Hoc Working Group of the Federal Coordinating Council on Science and Engineering Technology (FCCSET)
  -Served as Project Officer for the Agency's two cooperative agreements with the World Health Organization
  -Liaison with the World Health Organization on risk assessment harmonization issues and document preparation
  -Served on World Health Organization Task Force for the preparation of document on Principles of Risk Assessment (Vice-Chairman of task force meeting in London, United Kingdom in 1993)
  -International expert on the health effects of arsenic, chromium, and nickel.
  -Member of Risk Sciences Institute Rodent Bladder Carcinogenesis Work Group to produce a document on the relationship of rodent bladder cancer to humans
  -Member of Risk Sciences Institute Working Group on Meta-analysis to produce guidelines on the use of meta-analysis in human environmental epidemiology studies
  -Member of Office Human Resources Committee
  -Project officer for major Interagency agreements with the National Institute of Occupational Safety and Health, the U.S. Army, and the National Institute of Environmental Health Sciences
  -Epidemiologist on the Carcinogen Risk Assessment Verification Endeavor (CRAVE), the Agency's intra-agency group to approve the entry of carcinogen risk assessments onto its internationally available on-line risk assessment data base known as the Integrated Risk Information System (IRIS).
  -Project officer on mortality study of styrene-butadiene workers
  -Subject matter expert and contact on the Integrated Risk Information System (IRIS) for arsenic, chromium, and polycyclic aromatic hydrocarbons.
  -Project Officer on Memorandum of Understanding between EPA and the National Science Council of Taiwan for the purpose of conducting epidemiologic research in an area of Taiwan where there is endemic contamination of the water supply
  -Provided consultation to a cancer case-control study in Chile examining the association with arsenic exposure for the purpose of developing a cancer dose-response estimate

- **Lieutenant Colonel and Chief, Patient Accountability Division, Patient Administration Directorate, Walter Reed Army Medical Center**

  -Army reservist mobilized for Operation Desert Shield
  -Supervised 40 military and civilian personnel in Admissions and Dispositions, Air Evacuation, Hospital Treasury, and Patient Data Sections
  -Served, when needed, as Director of the Patient Administration Directorate, supervising 140 military and civilian personnel
  -Directed all areas of patient accountability including admission and disposition of patients, billing of patients, air evacuation of patients into and out of Walter Reed, insurance billing, and

the computer data base on patients

- Team Chief, Toxic Substances and Pesticides Team, U.S. Environmental Protection Agency

  -Served as Acting Team Chief from September 1990 to January 1991, supervising four Environmental Protection Specialists
  -Directed the team to identify, within the developing regulations and policies of the Office of Pesticides and Toxic Substances, areas of scientific concern to the Office of Research and Development and to orchestrate the scientific input from ORD to those areas of concern

- **Epidemiologist, Carcinogen Assessment Statistics and Epidemiology Branch**

  -Served as acting Branch Chief from September 1989 to March 1990, supervising two epidemiologists and four statisticians.
  -Prepared written expert evaluations of epidemiologic studies as part of the carcinogenic assessment of various chemicals
  -Expertly reviewed epidemiologic sections and issues prepared by other in-house or outside experts
  -Served as a member of CRAVE, the intra-agency committee that reviews Agency carcinogen risk assessments (weight-of-evidence classifications and cancer potency estimates) in monthly meetings and approves/disproves them for entry onto the Agency's on-line risk assessment data base (IRIS)
  -Chaired the Human Studies Issue Committee which was reviewing the Agency's Carcinogen Risk Assessment Guidelines for possible revisions to the human evidence section; organized an international workshop on the topic which was conducted in June 1989
  -Instructor for training on the Agency's Carcinogen Risk Assessment Guidelines
  -Project officer on a cooperative agreement to study cancer risk among chromate production workers, a major study being done in collaboration with researchers at the Johns Hopkins University School of Hygiene and Public Health.
  -Sponsor and advisor to the International Task Force on the Epidemiologic Assessment of Nickel Exposure attending meetings in Oxford, England and Hilton Head, SC.

- **Environmental Protection Specialist, Office of Pesticide Programs, EPA**

  -Planned and coordinated the regulatory review of four pesticide chemicals: creosote and coal tar; cacodylic acid; sodium methanearsonate; and 10,10-oxybisphenoxarsine under the Agency's Rebuttable Presumption Against Registration of Pesticide Chemicals process.

- **Environmental Health Specialist, Office of Planning and Management, EPA**

  -Reviewed process for registration of special pesticides
  -Participated in various Agency rulemaking procedures for the pesticide program
  -Participated in the establishment of the Agency's Carcinogen Assessment Group

- **Health Research Specialist, Office of Health Research, EPA**

-Prepared health research budgets and made recommendations for health research.
-Reviewed and prepared report on the Agency's electromagnetic research program including various recommendations for future research
-Prepared responses to Congressional and public inquiries regarding environmental health research

- **Patient Administrator, Rank: First Lieutenant, U.S. Beach Army Hospital**

-Supervised seven enlisted personnel and seven civilians
-Coordinated medical disability boards
-Chaired clinical record committee meetings
-Chaired tissue infection committee meetings
-Supervised handling of clinical records, admissions and dispositions, hospital statistics, third party liability claims, the hospital treasury, civilian medical claims, registration of births, the disposition of deceased, and CHAMPUS claims

PROFESSIONAL ASSOCIATIONS

Society for Epidemiologic Research
American Public Health Association
International Society of Environmental Epidemiology

PUBLICATIONS

Books

Gibb H (2004). Procedures for calculating cessation lag – arsenic and smoking as examples. Metal Ions in Biology and Medicine, Vol 8. Eds: MA Cser, I Sziklai László, JC Étienne, Y Maymard, J Centeno, L Khasanova, P Collery. Paris: John Libbey Eurotext pp 452-455.

Abernathy C, Chakraborti D, Edmonds JS, Gibb H, Hoet P, Hopenhayn-Rich C, et al. (2001). Arsenic and Arsenic Compounds. Environmental Health Criteria 224. Geneva: World Health Organization.

Editors: Centeno JA, Collery P, Vernet G, Finkelman RB, Gibb HJ, Etienne JC (2000). Metal Ions in Biology and Medicine. London: John Libbey and Company, Ltd.

Centeno JA, Martinez L, Ladich ER, Page NP, Mullick FG, Ishak KG, Zheng B, Gibb H, Thompson C, Longfellow C (2000). Arsenic-induced Lesions. Washington, DC: Armed Forces Institute of Pathology.

Aitio A, Aldridge N, Anderson D, Berry CL, Burnett R, Cabral JRP, Cardis E, Cikrt M, Clayson DB, Clegg DJ, Dybing E, Fielder R, Fishbein L, Gibb H, Goddard M, Goldstein B, Hertel R, et al. (1999) Principles for the Assessment of Risks to Human Health from Exposure to Chemicals. Environmental Health Criteria 210. Geneva: World Health Organization.

HERMAN J. GIBB (CONT.)

Younes M, Meek Me, Hertel RF, Gibb H, Schaum J (1998). Risk Assessment and Management. In: International Occupational and Environmental Medicine (Eds.: W. Bunn III, L. Fleming, I. Gardner, J.M. Harrington, J. Herzstein, J. Jeyaratnam). St Louis: Mosby.

Gibb, HJ. (1998). Arsenic-tainted Drinking Water: Crisis in India and Bangladesh. In: Encyclopedia Britannica 1998 Medical and Health Annual. London: Encyclopedia Britannica.

Gibb, HJ. (1997). Advances in EPA's Risk Assessment Methods. In: Advances in Risk Assessment of Copper in the Environment, eds. Lagos and Badilla-Ohlbaum. Santiago: Catholic University of Chile.

North W, Gibb H, Abernathy C. (1997). Arsenic: Past, Present, and Future Considerations. In: Arsenic - Exposure and Health Effects, eds. Abernathy, Calderon, and Chappell. London: Chapman and Hall.

Gibb H. (1997) Epidemiology and Cancer Risk Assessment. Fundamentals of Risk Analysis and Risk Management. New York: Lewis Publisher/CRC Press.

Farland WH, Gibb HJ. (1993) U.S. Perspective on balancing chemical and microbial risks of disinfection. In: Proceedings of the First International Conference on the Safety of Water Disinfection: Balancing Chemical and Microbial Risks. International Life Sciences Institute Press, ed. Carol Henry.

Gibb HJ, Farland WH (1992). Differences in animal and human responses to carcinogenic metals. Relevance of Animal Studies to the Evaluation of Human Cancer Risk. New York: Wiley-Liss, ed. D'Amato et al., pp 367-379.

Valaoras G, Cogliano VJ, Gibb HJ (1991). Risk assessment methodology applications in Greece: exposure to pesticides and chromium. Proceedings of the Environmental Health Conference in Greece. Conference held in Mytilene, Greece, September 3-6, 1991.

Gibb HJ, Chen CW (1989). Is inhaled arsenic carcinogenic for sites other than the lung? In: Assessment of Inhalation Hazards. U Mohr, editor-in-chief. Berlin: Springer-Verlag.

Gibb HJ, Chen CW, Hiremath CB (1986). Carcinogen risk assessment of chromium compounds. In: Proceedings of the Chromium Symposium 1986: An Update. Pittsburgh: Industrial Health Foundation.

Journals

Gibb HJ, Scialli A. 2005. Letter to the editor of the American Journal of Medical Genetics re: Edison and Muenke (2004) Mechanistic and epidemiologic considerations in the evaluation of adverse birth outcomes following gestational exposure to statins. In press.

Scialli A, Gibb H. 2005. Letter to the editor of Birth Defects Research re: Yauck et al. (2004) Proximity of Residence to Trichloroethylene-Emitting Sites and Increased Risk of Offspring Congenital Heart Defects among Older Women. In press.

HERMAN J. GIBB (CONT.)

Kolker A, Panov BS, Kundiev YI, Trachtenberg IM, Gibb HJ, Korchemagin VA, and Centeno JA. 2004. Mercury in the environment from past mining and use of mercury-enriched coal: the example of Gorlovka, Ukraine. Abstract. Proceedings of the Geological Society of America.

Park RM, Bena JF, Stayner LT, Smith RJ, Gibb HJ, Lees PSJ. Hexavalent chromium and lung cancer in the chromate industry: a quantitative risk assessment. Risk Analysis 24(5): 1099-1108.

Gibb HJ, Lees PSJ, Pinsky P (2004). Letter to the Editor, Re: The carcinogenicity risk assessment of chromium compounds. American Journal of Industrial Medicine 45(3): 310.

Lorber M, Gibb H, Grant L, Pinto J, and Lioy P. (2004) Assessment of inhalation exposures and potential health risks that resulted from the collapse of the World Trade Center. Environmental Manager, February, 27-29.

Hopenhayn C, Ferreccio C, Browning SR, Huang B, Peralta C, Gibb H, Hertz-Picciotto I. (2003) Arsenic exposure from drinking water and birthweight. Epidemiology 14(5):593-602.

Chen C, Gibb H. Procedures for calculating cessation lag. (2003) Regulatory Toxicology and Pharmacology 38(2): 157-165.

Gibb HJ (2002). Current perspectives on issues in risk assessment methods. Human and Ecological Risk Assessment 8(6):1249-1251.

Gibb HJ, Checkoway H, Stayner L (2002). Improving risk assessment. Human and Ecological Risk Assessment 8(6):1397-1404.

Centeno JA, Mullick FG, Martinez L, Page N, Gibb H, Longfellow D, Thompson C, Ladich ER (2002). Pathology related to chronic arsenic exposure. Environmental Health Perspectives 110(5):883-886.

Centeno JA, Mullick FG, Martinez L, Gibb H, Longfellow D, Thompson C (2002). Chronic arsenic toxicity: an introduction and overview. Histopathology 41(2):320-340.

Centeno JA, Mullick FG, Gibb HJ, Longfellow D, Thompson C. (2001). The International Tissue and Tumor Repository for Chronic Arseniasis at the Armed Forces Institute of Pathology. Environmental Health Perspectives 109(10):465.

Gibb HJ, Lees PSJ, Pinsky P, Rooney BC. (2000). Lung cancer among workers in chromium chemical production. American Journal of Industrial Medicine 38:115- 126.

Gibb HJ, Lees PSJ, Pinsky P, Rooney BC. (2000). Clinical findings of irritation among chromium chemical production workers. American Journal of Industrial Medicine 38:127-131.

Hopenhayn-Rich C, Browning SR, Hertz-Picciotto I, Ferreccio C, Peralta C, Gibb H (2000). Chronic arsenic exposure and risk of infant mortality in two areas of Chile. Environmental Health Perspectives 108:667-73.

HERMAN J. GIBB (CONT.)

Abernathy C, Chappell W, Gibb H, Guo HR, Meek B. (1996). Roundtable Summary: Is ingested inorganic arsenic (As_i) a threshold carcinogen? Fundamental and Applied Toxicology. Fundamental and Applied Toxicology 29: 168-175.

Blair A, Burg J, Foran J, Gibb H, Greenland S, Morris R, Raabe G, Savitz D, Teta J, Wartenberg D, Wong O, Zimmerman R. (1995). Guidelines for application of meta-analysis in environmental epidemiology. Regulatory Toxicology and Pharmacology 22:189-197.

Burin GJ, Gibb HJ, Hill RN. (1995). Human bladder cancer: evidence for a potential irritation-induced mechanism. Food and Chemical Toxicology 33(9):785-795.

Valentine JL, Cebrian ME, Garcia-Vargas GG, Faraji B, Kuo J, Gibb HJ, Lachenbruch PA. (1994) Daily selenium intake estimates for residents of arsenic endemic areas. Environmental Research 64:1-9.

Gibb HJ, Chen CW (1989). Evaluation of issues relating to the carcinogen risk assessment of chromium. The Science of the Total Environment 86:181-186.

Gibb HJ, Chen CW (1986). Multiplicative model interpretation of additive and multiplicative carcinogenic effects. Risk Analysis 6(2):167-170.

Gibb HJ, Chen CW (1984). Risk assessment of complex mixtures. Environmental Science Research 32:353-361.
Anderson E, Albert R, McGaughy R, Anderson L, Bayard S, Bayliss D, Chen C, Chu M, Gibb H, Haberman B, Hiremath C, Singh D, Thorslund T (1983). Quantitative approaches in use to assess cancer risk. Risk Analysis 3(4):277-295.

Brown KG, Boyle KE, Chen CW, Gibb HJ (1989). A dose-response analysis of skin cancer from inorganic arsenic in drinking water. Risk Analysis 9(4):519-528.

Chen CW, Gibb HJ, Moini, A (1991). Models for analyzing data in initiation-promotion studies. Environmental Health Perspectives 90:287-291.

Contributing Author of EPA Publications

Exposure and Human Health Evaluation of Airborne Pollution from the World Trade Center Disaster (External Review Draft) - 2002 http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=54667

Special Report on Ingested Inorganic Arsenic: Skin cancer; Nutritional Essentiality (Authored the epidemiology assessment section and part of the quantitative risk assessment section) - 1988

Health Assessment Document for Nickel and Nickel Compounds (Authored part of the epidemiology assessment section) - 1986

Health Assessment Document for Perchloroethylene (Authored the epidemiology assessment section) - 1985

HERMAN J. GIBB (CONT.)

Health Assessment Document for Ethylene Oxide (Authored the epidemiology assessment section) - 1985

Health Assessment Document for Trichloroethylene (Authored the epidemiology assessment section) - 1985

Health Assessment Document for Inorganic Arsenic (Authored the epidemiology assessment section) - 1984

Carcinogen Assessment of Coke Oven Emissions (Authored the epidemiology assessment section and part of the quantitative risk assessment section) - 1984

Health Assessment Document for Chromium (Authored the epidemiology assessment and part of the quantitative assessment section) - 1984

Rebuttable Presumption of Registration Against Creosote (Authored entire document. Published in Federal Register October 12, 1978)

Rebuttable Presumption of Registration Against Cacodylic Acid (Authored entire document. Published in Federal Register)

Rebuttable Presumption of Registration Against Monosodium Methanearsonate (Authored entire document. Published in Federal Register)

Rebuttable Presumption of Registration Against Disodium Methanearsonate (Authored entire document. Published in Federal Register)

Rebuttable Presumption of Registration Against 10,10-oxybisphenoxarsine (Authored entire document. Published in Federal Register)

PRESENTATIONS

Scientific

"Procedures for Calculating Cessation Lag – Arsenic and Smoking as Examples", presented at the 8th International Symposium on Metal Ions in Biology and Medicine, Budapest, Hungary, May 2004.

"OSHA's Hexavalent Chromium Standard Rulemaking—Some Potentially Relevant Risk Assessments", presented at the American Industrial Hygiene Association Meeting Session on OSHA's Hexavalent Chromium Standard Rulemaking – Status and Issues, Atlanta, GA, May 2004.

"Lung Cancer and Irritation Among Workers in Chromium Chemical Production", presented at Department of Environmental and Occupational Health Symposium, George Washington University Graduate School of Public Health, March, 2004.

"Chemical Risk Assessment in the USA", presented at the Workshop on Bulgarian Priorities in Chemical

HERMAN J. GIBB (CONT.)

Risk Assessment and Management, Sofia, Bulgaria, September 2003.

"Report of Federal Working Group on Pathology for the New Millennium", presented at meeting on Pathology for the New Millennium, sponsored by the Surgeon General of the U.S. Army, Walter Reed Army Medical Center, November, 2001.

"Toxic Metals and Carcinogenesis", "Considerations for Design of Epidemiologic Studies", "Considerations for Risk Assessment of Metals", presented at Workshop on Risk Assessment of Metals Workshop, INGEOMIN, Caracas, Venezuela, July 2001.

Co-chairperson, Arsenic: Human Exposure and Effects, Session of the 6th International Symposium on Metal Ions in Biology and Medicine, San Juan, Puerto Rico, May 8, 2000.

"Analysis of Mortality Among Chromate Production Workers", presented at Plenary Session of the 6th International Symposium on Metal Ions in Biology and Medicine, San Juan, Puerto Rico, May 8, 2000.

"Improving the Health Risk Assessment for Low Exposures to Arsenic and Chromium", American Occupational Health Conference, Philadelphia, May 19, 2000.

"Considerations for Design of Epidemiologic Studies", "Considerations for Risk Assessment of Metals" presented at Work Shop on Risk Assessment of Metals at the School of Science and Technology, Jackson State University, Jackson, Mississippi, March 1999.

"Lung Cancer Exposure Response Among Workers in Chromium Chemical Production" presented at the AESF/EPA Conference for Environmental Excellence, Orlando, Florida, January 1999.

"Chromium - Hazard Identification and Dose Response Assessment", presented at the Common Sense Initiative Metal Finishing Subcommittee meeting, Washington, D.C., June 2, 1997.

"Advances in EPA's Risk Assessment Methods" (author - H. Gibb), keynote address presented at the Risk Assessment of Copper in the Environment Workshop, Renaca, Chile, May 7-9, 1997.

"Carcinogenic Risk from Ingested Arsenic" (author - H.Gibb), presented at the National Research Council, Committee on Toxicology, Subcommittee on Arsenic in Drinking Water meeting, National Academy of Sciences, Washington, D.C., March 26-27, 1997.

"EPA's Proposed Carcinogen Risk Assessment Guidelines: Impact for Use of Human Data in Quantitative Risk Assessment" (author - H.Gibb), presented at the Incorporating Human Data in Quantitative Risk Assessment (QRA) for Carcinogens: Issues, Status, and Future Needs Symposium at the Society for Risk Analysis Annual Meeting, New Orleans, LA, December 9-11, 1997. Also chaired session on uncertainty analysis in the Symposium.

"Chromium - Case Study" (author H. Gibb), presented at the International Workshop on the Risk Assessment of Metals and Their Inorganic Compounds, Angers, France, November 13-15, 1996.

"Assessing the Health Risk of Arsenic" (author H. Gibb), keynote address presented at the International Seminar on Arsenic Exposure, University of Chile, Santiago, Chile, October 8 - 10, 1996.

HERMAN J. GIBB (CONT.)

“Carcinogenic Dose Response of Hexavalent Chromium” (authors Gibb, Chen, Lees, Pinsky, and Rooney), presented at the Chromium Symposium - 1996, hosted by the Industrial Health Foundation, Arlington, VA, April 23-24, 1996. Also co-chaired session on Epidemiology/human effects at the symposium.

“Potential Epidemiologic Study of the Situation in West Bengal” (author H.Gibb), presented at the International Conference on Arsenic in Ground Water: Cause, Effect and Remedy, Calcutta, India, February 6-8, 1995.

"Using measurable indicators of human health in comparative risk analysis and in evaluating progress in risk management" (author H. Gibb), presented at the 2nd International Comparative Risk Analysis Symposium - Priority Setting of Environmental Issues, held in Taipei, Taiwan, November 14-16, 1994.

"Arsenic toxicity" (author H. Gibb), presented at the Seminar on Chelation Therapy for Acute and Chronic Metal Intoxication, Great Lakes Association of Clinical Medicine, Pittsburgh, PA, September 14-15, 1994.

"Carcinogen risk assessment on arsenic - advantages of an epidemiologic study in Chile" (author H. Gibb), presented at the University of Chile, Santiago, Chile, June 1994.

"Can we detect a carcinogenic risk from arsenic-contaminated drinking water in the United States?" (author H. Gibb) presented at the American Chemical Society Meeting, held in Chicago, IL, August, 1993.

"Carcinogenic risk assessment of arsenic" (author H. Gibb) presented at the International Conference on Arsenic Exposure and Health Effects, held in New Orleans, LA, July 28-30, 1993.

"Are children more sensitive to carcinogens? Arsenic as an example" (author H. Gibb) presented at the U.S. Environmental Protection Agency Risk Assessment Forum Colloquium, "Children as a Sensitive Subpopulation", held May 10, 1990 in Washington, D.C.

"Differences in animal and human responses to carcinogenic metals" (authors H. Gibb and W. Farland) presented at the Conference on "Relevance of Animal Studies to Evaluate Human Cancer Risk", held in Austin, Texas December 6-8, 1991.

"Limitations with the use of human data in risk assessment" (author H. Gibb) presented at a meeting of the Committee on Risk Assessment Methodology, National Research Council, National Academy of Science held April 6, 1990 in Washington, D.C.

"Carcinogenic risk assessment of chromium in relation to a chromium-contaminated hazardous waste site" (author H. Gibb) presented at a meeting on Chromium Contamination in Jersey City, New Jersey held April 11-12, 1990 at the New Jersey Department of Environmental Protection, Trenton, New Jersey.

"Is inhaled arsenic carcinogenic for sites other than the lung?" (authors H. Gibb and C. Chen) presented at the symposium: "Assessment of Inhalation Hazards" held February 19-24, 1989 at the Hannover Medical

School, Hannover, Federal Republic of Germany.

"Carcinogen Risk Assessment Issues Related To Ingestion of Arsenic" presented at National Science Council of Taiwan meeting in Taipei, Taiwan and at Cheung Kung Medical School, Tainan, Taiwan in June 1988.

"Evaluation of issues relating to the carcinogenic risk assessment of chromium" (authors H. Gibb and C.Chen) presented at the symposium: "Chromium Paradox in Modern Life" held May 23-24, 1988 at the National Library of Medicine, Bethesda, MD.

"Carcinogen Risk Assessment of Chromium Compounds" (authors H. Gibb, C. Chen, and C. Hiremath) presented at the symposium: "Chromium symposium 1986 - an update" held May 20-21 at the Marriott-Crystal Gateway, Arlington, VA.

EPA Carcinogen Risk Assessment Guidelines

Location and Date	Audience
Boston, MA 1992	Regional Risk Assessment Workshop (Included industry, consultants, and state, local, and federal government personnel)
Headquarters (Washington) 1990	Office of Pesticides personnel
Headquarters (Washington) 1989	Representatives of Pan American Health Organization
San Juan, Puerto Rico 1989	EPA Field Office personnel, Commonwealth personnel
Johns Hopkins University (Baltimore) 1989	Environmental epidemiology Students
Region I (Boston) 1988	Regional and state personnel
Headquarters (Washington) 1987	Carcinogen Assessment Group
Region VIII (Denver) 1987	Regional and state personnel
Bethesda, MD 1994	National Institutes of Health course on risk assessment; focus of the course was on metals
Fairfax, VA 1993	Panel member along with representatives from OSHA, NIOSH, and MSA at the American Mining Congress Training Course on Risk Assessment
Savannah, GA 1993	Training course on risk assessment; part of the annual meeting of the Society for Risk Analysis
Juneau, AK 1992	Participated in a public hearing on Alaska state arsenic standards for drinking water and fish consumption as an expert scientist on the carcinogenicity of arsenic
Crystal City, VA 1992	Refractories Institute
Johns Hopkins University (Baltimore, MD) 1991	Attendees of the Johns Hopkins Summer Course in Epidemiology
Johns Hopkins University (Baltimore, MD) 1990	Attendees of the Johns Hopkins Summer Course in Epidemiology
Washington, D.C., 1990	Japanese Iron & Steel Executives

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Newcastle, Delaware 1990	Delaware State Air Quality Board
Pittsburgh, Pennsylvania 1989	Allegheny County Air Quality Board
Johns Hopkins University (Baltimore) 1989	Attendees of the Johns Hopkins Summer Course in Epidemiology
Amherst, Mass. 1989	State personnel, consultants, industry
Tucson, AZ 1987	Citizens meeting; Television press conference (During both presentations, I evaluated a cancer mortality study of persons exposed to trichloroethylene via the drinking water supply that had been conducted by the State of Arizona)
St. Louis, MO 1986	Air Pollution Control Assoc. meeting
Chicago, IL 1986	Air Pollution Control Assoc. meeting

INVITED EXPERT

- Member of U.S. Presidential Advisory Board on Science, Health and Engineering to the Ana G. Mendez University System, San Juan, Puerto Rico. Chairman of the Research Committee and Member of Retention Committee.

- Member of the International Tissue and Tumor Repository for Chronic Arseniasis Steering Committee at the Armed Forces Institute of Pathology, Washington, D.C.

- Member of the International Scientific Committee of the International Symposium on Metals in Biology and Medicine

- Invited Co-chaired of the session on Biological Implications of Metal Ions at the International Symposium on Metal Ions in Biology and Medicine, Budapest, Hungary, May 2004.

- At the invitation of the International Program on Chemical Safety (IPCS), served as a member of the IPCS Risk Assessment Steering Group 2001-2004.

- At the invitation of the Pan American Health Organization, chaired an International Technical Advisory Group to a University of Chile epidemiology study of the acute effects resulting from copper ingestion. Meetings in Washington, D.C., Santiago, Chile, and Pucon, Chile 2000-2003.

- At the invitation of the International Program on Chemical Safety, participated in Task Force meetings on Environmental Health Criteria Document on Arsenic, Brisbane, Australia (Nov 1999) and London, England (Oct 2000), document published as EHC 224, Arsenic and Arsenic Compounds (Second Edition), 2001.

- At the invitation of Catholic University, Santiago, Chile, participated on an advisory committee for an exposure assessment project on copper, 1997-2000. Meetings held in Santiago, Chile.

- Invited member of the International Program on Chemical Safety's Concise International Chemical Assessment Document Final Review Boards in Brussels, Belgium (Nov 1996), Washington, D.C. (Chairman) (Nov 1998), Stockholm, Sweden (Nov 1999), Tokyo, Japan (June 1998), Sydney, Australia

(Nov 1999), Helsinki, Finland (June 2000), Geneva, Switzerland (Jan 2001), Ottawa, Canada (Oct 2001), Monks Wood, England (September 2002), Varna, Bulgaria (September 2003), and Hanoi, Vietnam (September 2004).

- Invited member of the Concise International Chemical Assessment Document Steering Group Committee, Research Triangle Park, NC (January 1995); London, United England (September 1997); and Hannover, Germany (October 1998).

- Participated as a member of the U.S. delegation to the International Forum on Chemical Safety, Ottawa, Canada, January 1997. Drafted the U.S. position on risk assessment.

- At the invitation of the International Programme on Chemical Safety, participated on a working group to develop a document on Principles of Risk Assessment, Geneva, Switzerland, September 1996.

- At the invitation of the ILSI Risk Science Institute, participated in a 2 day workshop on Human Variability, Doubletree Hotel, Washington, D.C., October 1995.

- At the invitation of the Brookings Institution, served on an Advisory Committee for Curriculum Development of the Brookings Institution's Issues in Science and Technology Policy Seminar, Brookings Institution, Washington, D.C., October 1995.

- At the invitation of the Department of Environmental Studies, Jadavpur University, Calcutta, India, participated in the International Conference on Arsenic in Ground Water: Cause, Effect, and Remedy, Calcutta, India, 6-8 February, 1995, and provided consultation on steps to evaluate an arsenic contamination of drinking water problem in West Bengal, India.

- At the invitation of the Department of Energy, participated in a panel review of proposals submitted to the Department of Energy to support Risk Assessment and Risk Management practices in Environmental Management (November 1994).

- At the invitation of the Department of Physical Sciences and Mathematics of the University of Chile, Santiago, Chile, served as an advisor to a study of arsenic exposure and cancer risk in Chile (April 1994).

- At the invitation of the United Arab Emirates, provided consultation to that government on chromium contamination of drinking water wells in the Emirate of Abu Dhabi, in Abu Dhabi (September 1993).

- At the invitation of Health Canada, provided consultation to that agency on epidemiologic studies on nickel refinery workers for use in a dose-response analysis on nickel and on cancer dose-response assessment for chromium exposure using an epidemiologic study, in Ottawa, Canada (May 1993).

- At the invitation of the Republic of China (Taiwan) Environmental Protection Administration, provided training to Taiwan EPA, scientists, engineers, chemists, and risk management personnel on comparative risk assessment in Taipei, Taiwan (April 19-23, 1993).

- At the invitation of the BIBRA Toxicology International, attended meetings in London, England to prepare a World Health Organization International Program on Chemical Safety document on Scientific

HERMAN J. GIBB (CONT.)

Principles for Assessment of Risk To Human Health Associated With Chemical Exposures, March 1992 and March 1993. Served as Vice-chairman of the March 1993 session.

- At the invitation of the Canadian government, invited to Ottawa, Canada by Health and Welfare Canada to provide consultation regarding the health effects of chromium and nickel (May 1993).

- At the invitation of the Canadian government, provided consultation to Health and Welfare Canada regarding the health effects of arsenic Ottawa, Canada (November 1990)

- At the invitation of the Bulgarian government, provided consultation to the Bulgarian Ministries of Health and Agriculture regarding arsenic contamination of the Topolonitza River (September 1990)

- At the invitation of the New Jersey Department of Environmental Protection, provided expert consultation regarding chromium contamination of Jersey City (January

- April, 1990); Reviewed State of New Jersey risk assessment of chromium-contaminated site at Jersey City (July 1992); Invited to Trenton, N.J. to discuss the New Jersey risk assessment in August 1992.

PEER REVIEWER

- "Dietary metals, phytochemicals and cancer", a journal article submitted to *Ecotoxicology and Environmental Safety*, January 2005.

- "The use of observational human data for risk assessment", a journal article submitted to *Risk Analysis*, October 2004.

- "Evaluating emerging issues in epidemiology", a journal article submitted to *Environmental Health Perspectives*, March 2004.

-"Trace elements in the general population vs. cancer patients", a research funding proposal submitted to Fonds zur Forderung der wissenschaftlichen Forschung, Vienna, Austria, December 2002.

-"Biological gradient between long term arsenic exposure and carotid atherosclerosis", an article submitted to *Circulation*, December 2001.

-"Lung cancer mortality in nickel/chromium platers - 1946-95", an article submitted to *Occupational and Environmental Medicine*, March 1997.

-"Quantitative risk assessments derived from occupational cancer epidemiology: a worked example", an article submitted to *Occupational and Environmental Medicine*, March 1997.

- "Using Ecological Data to Estimate a Regression Model for Individual Data: The Association between Arsenic in Drinking Water and Incidence of Skin Cancer", an article submitted to *Environmental Research*, January 1996.

-"Unit risk estimates for airborne arsenic exposure: an updated view based on recent data from two copper smelter cohorts" an article submitted to *Regulatory Toxicology and Pharmacology*, 1994.

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-"Nickel and its Compounds", a criteria document prepared by Health Canada, September 1993.

-"Chromium", a criteria document prepared by Health Canada, April 1993.

-"Health Risk Assessment, Appendix: International Risk Assessment", prepared by the Office of Technology Assessment, U.S. Congress, January 1993.

-"Proposal for Funding to Develop Urinalysis Monitor for Detection of Occupational Exposure to Arsenic", prepared by Klohn Leonoff, Consulting Engineers for the Industrial Research Assistance Program of the National Research Council of Canada, December 1990.

-"Health Effects of Coal Tar Products and Bitumens", prepared by the Occupational Health Program, McMaster University, Hamilton, Ontario for the Ontario Ministry of Labour, Ontario, Canada, September 1986.

-"Retrospective Cohort Mortality Study of Dry Cleaner Workers Using Perchloroethylene", prepared by David Brown, National Institute of Occupational Safety and Health, and Samuel Kaplan, Stanford Research Institute, for the National Institute of Occupational Safety and Health, Cincinnati, Ohio, December 1985.

-Proposal to the March of Dimes for funding to study "Childhood Cancer and Occupational Exposure", 1984.

HONORS AND AWARDS

2002 EPA Gold Medal for Exceptional Service

2002 Special Commemorative EPA Award for September 11 Activities, World Trade Center Particulate Matter Toxicological Assessment Team

2002 Scientific and Technological Achievement EPA Award Level III

2002 EPA Bronze Medal for Commendable Service

2001 U.S. EPA's National Center for Environmental Assessment's Peer Award for International Environmental Protection

1997 EPA Bronze Medal in recognition of the Multimedia Research Coordination Team

1985 EPA Bronze Medal for Commendable Service

Publications of Dr. Herman Gibb
1997-2007

Gibb HJ, Kozlov K, Centeno JA, Poulin J, Jurgenson V, Kolker A, Conko KM, Landa ER, Panov BS, Panov YB, Xu H (2007). Occupational Mercury Exposure at a Mercury Recycling Facility in Ukraine. In Press.

Lorber M, Gibb H, Grant L, Pinto J, Pleil J, Cleverly D (2007). Assessment of inhalation exposures and potential health risks to the general population that resulted from the collapse of the World Trade Center Towers. Risk Analysis 27(5):1203-1221.

Kolker, A., Conko, K.M., Landa, E.R., Kozlov, K., Trachtenberg, I., Panov, B.S., Panov, Y.B., Korchemagin, V.A., Shendrik, T., Gibb, H.J., Centeno, J.A., 2007. Health implications of inorganic mercury exposure in Gorlovka, Ukraine. In: Proceedings, 2nd National Conference on USGS Health-Related Research, http://health.usgs.gov/

Gibb HJ, Scialli A. 2005. Letter to the editor of the American Journal of Medical Genetics re: Edison and Muenke (2004) Mechanistic and epidemiologic considerations in the evaluation of adverse birth outcomes following gestational exposure to statins. American Journal of Medical Genetics 135A:230-231.

Scialli A, Gibb H. 2005. Letter to the editor of Birth Defects Research re: Yauck et al. (2004) Proximity of Residence to Trichloroethylene-Emitting Sites and Increased Risk of Offspring Congenital Heart Defects among Older Women. Birth Defects Res A Clin Mol Teratol. 73(4):255

Kolker A, Panov BS, Kundiev YI, Trachtenberg IM, Gibb HJ, Korchemagin VA, and Centeno JA. 2004. Mercury in the environment from past mining and use of mercury-enriched coal: the example of Gorlovka, Ukraine. Abstract. Proceedings of the Geological Society of America.

Park RM, Bena JF, Stayner LT, Smith RJ, Gibb HJ, Lees PSJ. (2004) Hexavalent chromium and lung cancer in the chromate industry: a quantitative risk assessment. Risk Analysis 24(5): 1099-1108.

Gibb H (2004). Procedures for calculating cessation lag – arsenic and smoking as examples. Metal Ions in Biology and Medicine, Vol 8. Eds: MA Cser, I Sziklai László, JC Étienne, Y Maymard, J Centeno, L Khasanova, P Collery. Paris: John Libbey Eurotext pp 452-455.

Gibb HJ, Lees PSJ, Pinsky P (2004). Letter to the Editor, Re: The carcinogenicity risk assessment of chromium compounds. American Journal of Industrial Medicine 45(3): 310.

Lorber M, Gibb H, Grant L, Pinto J, and Lioy P. (2004) Assessment of inhalation exposures and potential health risks that resulted from the collapse of the World Trade Center. Environmental Manager, February, 27-29.

Hopenhayn C, Ferreccio C, Browning SR, Huang B, Peralta C, Gibb H, Hertz-Picciotto I. (2003) Arsenic exposure from drinking water and birthweight. Epidemiology 14(5):593-602.

Chen C, Gibb H. Procedures for calculating cessation lag. (2003) Regulatory Toxicology and

Pharmacology 38(2): 157-165.

Gibb HJ (2002). Current perspectives on issues in risk assessment methods. Human and Ecological Risk Assessment 8(6):1249-1251.

Gibb HJ, Checkoway H, Stayner L (2002). Improving risk assessment: priorities for epidemiologic research. Human and Ecological Risk Assessment 8(6):1397-1404.

Centeno JA, Mullick FG, Martinez L, Page N, Gibb H, Longfellow D, Thompson C, Ladich ER (2002). Pathology related to chronic arsenic exposure. Environmental Health Perspectives 110(5):883-886.

Centeno JA, Mullick FG, Martinez L, Gibb H, Longfellow D, Thompson C (2002). Chronic arsenic toxicity: an introduction and overview. Histopathology 41(2):320-340.

Centeno JA, Mullick FG, Gibb HJ, Longfellow D, Thompson C. (2001). The International Tissue and Tumor Repository for Chronic Arseniasis at the Armed Forces Institute of Pathology. Environmental Health Perspectives 109(10):465.

Abernathy C, Chakraborti D, Edmonds JS, Gibb H, Hoet P, Hopenhayn-Rich C, et al. (2001). Arsenic and Arsenic Compounds. Environmental Health Criteria 224. Geneva: World Health Organization.

Editors: Centeno JA, Collery P, Vernet G, Finkelman RB, Gibb HJ, Etienne JC (2000). Metal Ions in Biology and Medicine. London: John Libbey and Company, Ltd.

Centeno JA, Martinez L, Ladich ER, Page NP, Mullick FG, Ishak KG, Zheng B, Gibb H, Thompson C, Longfellow C (2000). Arsenic-induced Lesions. Washington, DC: Armed Forces Institute of Pathology.

Gibb HJ, Lees PSJ, Pinsky P, Rooney BC. (2000). Lung cancer among workers in chromium chemical production. American Journal of Industrial Medicine 38:115- 126.

Gibb HJ, Lees PSJ, Pinsky P, Rooney BC. (2000). Clinical findings of irritation among chromium chemical production workers. American Journal of Industrial Medicine 38:127-131.

Hopenhayn-Rich C, Browning SR, Hertz-Picciotto I, Ferreccio C, Peralta C, Gibb H (2000). Chronic arsenic exposure and risk of infant mortality in two areas of Chile. Environmental Health Perspectives 108:667-73.

Aitio A, Aldridge N, Anderson D, Berry CL, Burnett R, Cabral JRP, Cardis E, Cikrt M, Clayson DB, Clegg DJ, Dybing E, Fielder R, Fishbein L, Gibb H, Goddard M, Goldstein B, Hertel R, et al. (1999) Principles for the Assessment of Risks to Human Health from Exposure to Chemicals. Environmental Health Criteria 210. Geneva: World Health Organization.

Younes M, Meek Me, Hertel RF, Gibb H, Schaum J (1998). Risk Assessment and Management. In: International Occupational and Environmental Medicine (Eds.: W. Bunn III, L. Fleming, I. Gardner, J.M. Harrington, J. Herzstein, J. Jeyaratnam). St Louis: Mosby.

Gibb, HJ. (1998). Arsenic-tainted Drinking Water: Crisis in India and Bangladesh. In: Encyclopedia Britannica 1998 Medical and Health Annual. London: Encyclopedia Britannica.

Gibb, HJ. (1997). Advances in EPA's Risk Assessment Methods. In: Advances in Risk Assessment of Copper in the Environment, eds. Lagos and Badilla-Ohlbaum. Santiago: Catholic University of Chile.

North W, Gibb H, Abernathy C. (1997). Arsenic: Past, Present, and Future Considerations. In: Arsenic - Exposure and Health Effects, eds. Abernathy, Calderon, and Chappell. London: Chapman and Hall.

Gibb H. (1997) Epidemiology and Cancer Risk Assessment. Fundamentals of Risk Analysis and Risk Management. New York: Lewis Publisher/CRC Press.

All Testimony Given by Dr. Herman Gibb

- **DEPOSITION**
  Lawrence O'Connor, et al.
  v.
  Boeing North American, Inc., et al.
  State of California
  Case No. CV 97-1554 DT (RCx)
  Deposition June 9, 2005

- **DEPOSITION**
  Mary E. Green, et al., Plaintiffs
  v
  Alpharma Inc., et al., Defendants
  In the Circuit Court of Washington County, Arkansas
  Case No. CIV 03-2150-2
  Deposition January 17, 2006

- **TESTIMONY**
  The International Centre for the Settlement of Investment Disputes
  In the Matter of Arbitration Between Compania de Aguas del Aconquija and Vivendi Universal, Claimants
  and
  Argentine Republic, Respondent.
  Case No. ARB/97/3
  The World Bank
  1818 H Street, N.W.
  "MC" Building
  Conference Room 13-121
  Washington, D.C.
  Testimony July 28, 2006

- **DEPOSITION**
  Alfred D'Ulisse, Plaintiff,
  Re: New York City Asbestos Litigation
  Index Number: 113838-04
  Supreme Court of the State of New York
  All Counties within New York City
  Deposition August 1, 2006

- **DEPOSITION**
  Steven and Kathy Adwell et al., Plaintiffs
  vs.
  Contigroup Companies, et al., Defendants
  Case No. 02CV221544

  Michael Adwell et al., Plaintiff
  vs.
  Contigroup Companies, et al., Defendants
  Case No. 02CV221529
  In the Circuit Court of Jackson County, Missouri at Kansas City
  Deposition August 9, 2007.

- **DEPOSITION**
  Jeannette G. Hebert, Individually and as Executrix of the Estate of Raymond G. Hebert, Jr., Plaintiff
  v.
  Alfal Laval et al., Defendants
  Commonwealth of Massachusetts
  Middlesex County
  Department of the Trial Court
  Civil Action No. 06-1599
  Deposition October 26, 2007

Billing Rates for Dr. Herman Gibb

Research:	$275/hour
Trial:	$413/hour